SPR SOCIAL POLICY RESEARCH ASSOCIATES

State of California
Employment Training Panel
Program Assessment

Final Report
Revised March 2020

Annelies Goger, Ph.D.
Marian Negoita, Ph.D.
Renatta DeFever, Ph.D.
Przemyslaw Nowaczyk, M.A.

Acknowledgements

The authors would like to thank Sara Miller, Kate Dunham, Vinz Koller, Ron D'Amico, and Andrew Wiegand at Social Policy Research Associates for their support and advice on this project. In addition, we acknowledge and appreciate assistance from Stewart Knox, Peter Cooper, Mario Maslac, and Bryan Lytle at ETP in facilitating research activities and collection of administrative data. We are especially grateful for all the staff, employers, labor organizations, and intermediaries who gave us their time to be interviewed for this project; we valued hearing their perspectives.

Table of Contents

Executive Summary

The State of California Employment Training Panel (ETP) contracted with Social Policy Research Associates (SPR) in September 2017 to conduct an assessment of its programs. ETP programs support and fund employers to train workers in order to retain quality jobs in the state, increase competitiveness, enhance the transferable skills of the workforce, and improve productivity and quality. The assessment examined how employers and workers benefit from these investments, how ETP can promote continuous improvement, and how its policies can be updated to reflect current training needs, training delivery methods, and economic trends.

The research for this study took place in two phases. In the first phase, SPR used a mixed-methods approach to conduct the assessment between September 2017 and April 2018—a time when California's economy was very strong and labor markets were tight. We conducted 23 qualitative interviews with staff, intermediaries,[1] employers, and labor organizations. We also conducted a quantitative outcomes analysis using ETP administrative data and annual reports. Finally, we developed an employer survey instrument to administer in the future (Appendix C). In the second phase that took place between March 2019 and February 2020, we conducted a quasi-experimental impact study.

Although SPR's findings are preliminary due to limitations in available data, time, and resources, this report includes recommendations for ETP programs as well as specific suggestions for enhancing internal capacity for evaluation and alternative study designs. We also recommend that ETP commission a more in-depth evaluation in the future to analyze outcomes and impacts that were not feasible for us to examine.

Key findings

Interview informants widely supported ETP's mission and felt that the program offered a valuable source of incumbent worker training funds that was not sufficiently available elsewhere. SPR's findings also suggest several ways in which the program can be improved and updated.

How employers and workers benefit from ETP

- Employers and labor organizations ("users") reported many benefits to ETP participation. ETP funding helped them retain and motivate their workforce, establish or update internal human resources training systems, stay competitive by keeping their employees updated on the latest

[1] "Intermediaries" refers to third-party entities that ETP collaborates with to administer multiple-employer contracts. Examples include industry associations, labor unions and federations, community colleges, and workforce boards.

technologies, maintain more rigorous quality control processes, and train workers on new equipment or technology during major upgrades or expansions.

- **Users, ETP staff, and intermediaries observed that small and mid-sized employers tended to report a greater impact of ETP funding**. ETP had more organizational effects on small and mid-sized employers. These included formalizing internal training systems and facilitating expansion. These employers also reported more observable outcomes from the use of ETP funds, such as adding more employees and increasing revenue. Large firms tended to use ETP to supplement existing training, retain workers, and adapt to new technologies.
- **Users, ETP staff, and intermediaries reported that workers benefited from ETP**. They did so through opportunities to transfer into a new career path or advance within the company, increased motivation and a feeling that the employer valued them, increased wages, and—in some cases—attainment of credentials. Future research is needed to learn more about trainees' own perceptions.
- **ETP provided significant support for incumbent worker training, and informants felt the program was serving its mission and meeting the needs of both employers and workers.** In each year from 2012 to 2017, ETP approved an average of 388 new contracts for training and approved an average of $80.7 million for new contracts to train 85,703 trainees.
- **ETP can be enhanced by reaching a more representative set of employers and workers**. ETP funding is currently concentrated among large firms and male trainees. ETP can reach a more representative group of employers and trainees by enhancing outreach to employers and industry sectors that have more female workers, as many employers are not aware of ETP or clear about eligibility for and use of ETP funding.
- **Factors such as company size, labor turnover rate, training dosage, contract type, and industry sector appear to influence outcomes.** Small companies, those with high labor turnover, and those in certain industry sectors were more likely to train a higher share of their workforce. Spending more per approved trainee, participation in a multiple-employer contract (MEC), being a small or mid-sized company, and having low levels of labor turnover led to higher likelihood of achieving training as planned.

How can ETP promote continuous improvement?

- **Some of ETP's administrative processes and information systems were viewed as overly cumbersome, although they had become more efficient and flexible in recent years.** In particular, eligibility, reporting requirements, and reimbursement rates were confusing to users and could be a barrier to access.
- **ETP has expanded partnerships using MECs, broadening the reach of ETP and enabling it to collaborate more with other intermediaries in the workforce system, but barriers remain.** Informants welcomed the greater coordination and reported that the MECs increased access for small and mid-sized firms. However, the pay-for-performance structure and complex administrative processes were barriers to expanding partnerships further.
- **Collaboration is allowing ETP to target skills upgrading to specific sectors and to enhance support for innovative models of training.** Increased coordination showed promise for addressing issues of statewide concern, such as a need for workers who were skilled in electric vehicle technologies, and for helping to support workforce innovation, such as apprenticeships in non-traditional industries.

Updating ETP to meet current training needs

- **Current and future skills training needs varied by sector and occupation, but users expressed a broad-based need for training on new technologies, lean production, and managerial and supervisory skills.** In non-technology fields, informants reported that employees need more digital literacy skills; in technology fields, employers were challenged to ensure their workers keep skills on pace with cutting-edge technologies.
- **Employers were using more online training components and learning management systems, but they still valued classroom-based training.** Low-tech and smaller employers were migrating some training content online and were beginning to implement learning management systems to administer and track training activities. Large and high-tech employers were migrating to self-driven, customized training platforms. Employers of all sizes reported that classroom training would remain a valuable delivery model, but it would be supplemented by online modules and self-driven learning platforms.
- **Employers were not frequently using ETP to support online or on-the-job training,[2] even though they used both modes of training extensively.** Common explanations for this paradox were lack of awareness by employers that online and on-the-job training were allowed, low reimbursement rates for online training, and the burden of implementing reporting requirements for such modes of training—which users felt should focus on competency more than training hours.
- **Small and mid-sized employers had a high need for more technical assistance and guidance.** Interview informants noted that small and mid-sized employers need more assistance with establishing more formal training strategies, identifying quality providers, understanding ETP rules, and accessing other sources of government support, especially during rapid expansion.
- **The value employers placed on industry-recognized credentials varied greatly, but those in highly regulated industry sectors were more likely to value them more.** Healthcare, aerospace, food manufacturing, and pharmaceutical employers were more likely to report a strong emphasis on industry-recognized credentials to improve quality and reduce regulatory risk.

ETP's Impacts

- **A quasi-experimental impact study suggested that ETP had a positive impact on company-level outcomes.** ETP-funded companies had, on average, more employees and higher revenues than a matched sample of comparison companies that were not funded by ETP (which approximate what would have happened in the absence of ETP funding).
- **Impacts varied by firm size, firm age, and industry.** On average, firms with between 19-100 employees, firms between 11 and 30 years of age, and firms from the retail and manufacturing sectors appeared to benefit more from participation than other types of companies. This suggests that ETP participation may be especially impactful for companies that are mature enough to have developed a training infrastructure, but which are also relatively young or small, making them more likely to underinvest in training.

[2] ETP defines "computer-based training" as training that has no instructor and is performed on a computer and "productive lab" as on-the-job training. In this report, we use the terms "online" and "on-the-job" (although we understand that some computer-based training is not performed online) for shorthand and to make it more accessible to a wide audience, as those terms are more commonly used among employers and in workforce policy. ETP has specific rules that govern the conditions under which computer-based training and productive lab training are eligible for reimbursement.

1. Introduction

Employers in the United States express growing concern about a skills shortage in the skilled trades, in middle-skill occupations, and for workplace skills such as problem solving and communication.[3] At the same time, labor markets have become increasingly precarious for workers who express growing difficulty finding "quality" jobs such as full-time positions with job security, benefits, and internal career ladders and growth potential.[4] The inability of labor markets to effectively satisfy the needs of both employers and workers suggests market failures are occurring and that there is a growing need for policy intervention. As income inequality reaches unprecedented levels, and new technologies such as artificial intelligence rapidly transform the nature and structure of work, there will likely be an even greater need to enhance labor market policy interventions and adapt education and training systems to the "future of work."[5]

One such policy tool is investment in work-based incumbent worker training focused on upskilling an employer's existing workforce by providing opportunities for applied and contextualized learning.[6] This approach also addresses demand-side labor market failures such as the tendency for employers to underinvest in training (for example, because of fear that other employers will "poach" their trained employees), an observed bias in employer support for high-skill worker training, and a relative underinvestment in frontline worker training.[7] In addition, incumbent worker training may increase retention and enhance the likelihood of rapid re-employment because the training upgrades workers' skills.[8]

What is ETP?

Created in 1982, the Employment Training Panel (ETP) is a California state agency that provides significant support for incumbent worker training to retain businesses and jobs in the state, increase the competitiveness of companies in California, and enhance workforce skills.

Created in 1982, the Employment Training Panel (ETP) is a California state agency that provides significant support for incumbent worker training in order to retain businesses and jobs in the state, increase the competitiveness of companies in California, and enhance workforce skills. ETP is governed by an eight-member Panel that has representation from labor, business management, and state government. ETP's programs are funded through a tax collected from employers alongside the unemployment insurance tax and through other sources of state funding to support special training initiatives. ETP prioritizes approving applications for training funds that align with statewide priorities and special initiatives, such as training in priority industries and training for veterans, youth with disabilities, and small businesses in areas with high unemployment.

[3] Morrison et al., *Boiling Point? The Skills Gap in US Manufacturing*.

[4] Kalleberg, *Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States, 1970s to 2000s*; Farrell and Greig, *Paychecks, Paydays, and the Online Platform Economy: Big Data on Income Volatility*.

[5] World Economic Forum, *Accelerating Workforce Reskilling for the Fourth Industrial Revolution: An Agenda for Leaders to Shape the Future of Education, Gender and Work*; Manyika et al., *A Future That Works: Automation, Employment, and Productivity*.

[6] Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?; Lerman, Should Employer-Led Training Be the Framework for Workforce Development?*; Zeidenberg, Cho, and Jenkins, *Washington State's Integrated Basic Education and Skills Training Program (I-BEST).*

[7] Osterman, Improving Job Quality: *Policies Aimed at the Demand Side of the Low-Wage Labor Market;* Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?*

[8] Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?*

ETP contracted with Social Policy Research Associates (SPR) in September 2017 to conduct an ETP program assessment. The purpose was to understand how employers and workers are benefitting from ETP-funded training investments, how the program can promote continuous improvement, and how it can be updated to reflect current training needs, training delivery methods, and economic trends.

During the time of the assessment, California had a very strong economy, with 2.4 percent growth in 2017 and 4.8 percent unemployment, the lowest since 2000.[9] Several employers reported expanding and investing in new technologies and experiencing challenges retaining their highest skilled workers due to high demand for labor. Thus, the findings should be interpreted with the strong economy in mind, because the ways that employers and labor organizations use training funds is likely to be very different during a recession. In addition, SPR's findings in this report are preliminary, because the time period for the assessment was relatively short, there were several limitations in the available data, and the interview sample size was relatively small. There is potential for ETP to commission a more comprehensive assessment in the future that includes enhanced data analyses, additional in-depth interviews and case studies, and an employer survey.

Section 2 of this report describes research questions and methods that guided the assessment. In Section 3 we describe the ETP program structure, governance, and types of funding streams and contracts. Sections 4 and 5 summarize characteristics and outcomes of ETP-funded companies, contracts, and trainees. Section 5 also summarizes qualitative findings about how users experienced the benefits and impacts of ETP participation. Sections 6 and 7 draw largely on our qualitative data to share how ETP staff, intermediaries, and users perceived the program's administrative processes, its emerging practices and partnerships, and how ETP can be updated to meet current training needs and delivery methods. Section 8 presents the main findings from a quasi-experimental impact study. The report concludes with a summary of findings and recommendations for enhancing ETP's potential to reach and serve employers and workers in California.

2. Research questions and methods

SPR used a combination of qualitative and quantitative methods to assess ETP. The qualitative components of the assessment included 12 semi-structured interviews with key informants and 11 semi-structured interviews with program users (Table 1). We collected primary and secondary data from October 2017 to April 2018 for the first phase of the study, and from March 2019 to December 2019 for the second phase (quasi-experimental study). To protect the privacy and confidentiality of informants, we report findings anonymously.

Table 1: Description of Informants for the Qualitative Research

Method	Informants
Key informant interviews (n=12)	ETP staff members: staff from field offices and ETP headquarters at multiple levels Intermediaries: administrators of multiple-employer contracts, including two industry associations, a community college, a labor organization, and a third-party consultant
User interviews (n=11)	Employers: companies participating in ETP (single- and multiple-employer contracts) Labor organizations: entities that have had ETP multiple-employer contracts for training, including labor unions and nonprofits, and that did not subcontract to other employers

[9] Los Angeles Economic Development Corporation, *Economic Forecast and Industry Outlook: California and Los Angeles County, 2018–2019*.

The purpose of the key informant interviews was to understand the program context and partnerships, the value of the program, and how it can be improved. The purpose of the user interviews was to obtain feedback about the benefits of participation, how participants use ETP funds in combination with other sources of funds for training, their experiences with ETP program administration, and how ETP programs can be enhanced to meet current training needs. The users were selected to capture diversity across a range of variables such as industry sector,[10] regions of the state, type of contract (single employer and multiple employer), and company size.[11]

The sample sizes for the qualitative interviews are low, so the results may not be representative and should be interpreted with caution. As part of the qualitative component of the assessment, SPR also developed an employer survey instrument for future administration (see Appendices B and C).

Research questions

What are the benefits and value of ETP to companies and workers?

- What are the measurable benefits to companies generated through ETP-funded training? How do these benefits vary by training type, funding source, or employer sector?
- What are the benefits of ETP-funded training to workers and employees?

How can ETP promote continuous improvement?

- How can the ETP outreach, application, and compliance processes be improved to ensure equal access to training funds and to reduce inefficiencies?
- What are employers' experiences with ETP and their recommendations for improvement?
- How is the ETP program partnering with other workforce-related initiatives in California such as community college career pathways initiatives, apprenticeships, and economic development programs?
- Which workforce intermediaries are employers already engaging with or interested in engaging with more to meet their current and future workforce needs?
- What promising practices and innovations are emerging from ETP training programs?

How can ETP be updated to meet current training needs?

- What workforce challenges do employers expect to face in the next three years?
- What are the future training needs of employers, including their interest in developing apprenticeships and other new models of training?
- How important are credentials to employers, and which credentials do employers value or require the most in each priority sector?
- How do employers leverage ETP funding in combination with other training programs and their own resources to meet their needs for workforce training and process improvement?

For the quantitative components of the assessment, we first conducted a feasibility assessment to determine what outcomes and impacts could be analyzed based on available data and the unit of analysis (company level). We then generated a series of descriptive statistics based on ETP's annual reports and administrative data to understand how the program is used by employers and labor organizations. Subsequently, we conducted an outcomes analysis of the effect of ETP training programs on training

[10] SPR interviewed users from manufacturing, healthcare, pharmaceuticals, aerospace, information technology, entertainment, hospitality, the building trades, and janitorial services.

[11] All interviews lasted 45 minutes to 1 hour. Some were recorded for accuracy with permission from the informant.

completed versus planned. Finally, we conducted a quasi-experimental impact study that estimated the impacts of ETP on company size and revenue. Appendix A and Appendix D contain more details on the quantitative methods.

3. Background on ETP

The ETP legislation[12] explains that the purpose of ETP training programs is to improve the competitiveness of California businesses, to help creating and retaining high-wave, and to improve the overall skills of California workforce.

According to key informants, the ETP Legislation is relatively short and allows considerable discretion to the eight-member Panel and Executive Director to implement the program and establish regulations.[13] ETP regulations generally specify what types of training are eligible for reimbursement, the rates of reimbursement, and the manner in which employers are required to document training. According to ETP staff, the last major overhaul of ETP regulations occurred over 10 years ago, and another major overhaul is needed in order to clarify existing rules, simplify the program, and implement pilot programs.

ETP's administrative process

Employers, worker representatives, and third parties can apply for ETP funding through two main contracting mechanisms:

1) Single-employer contracts: An individual employer applies for funds independently or with the help of a third party.
2) Multiple-employer contracts (MECs): A third party—typically an industry association, community college, labor organization, workforce board, or similar intermediary—receives a master contract it can administer to multiple employers in smaller amounts.

Multiple-employer contracts increased access for small and mid-sized companies

Although

88%

of companies receiving ETP funds used multiple-employer contracts,

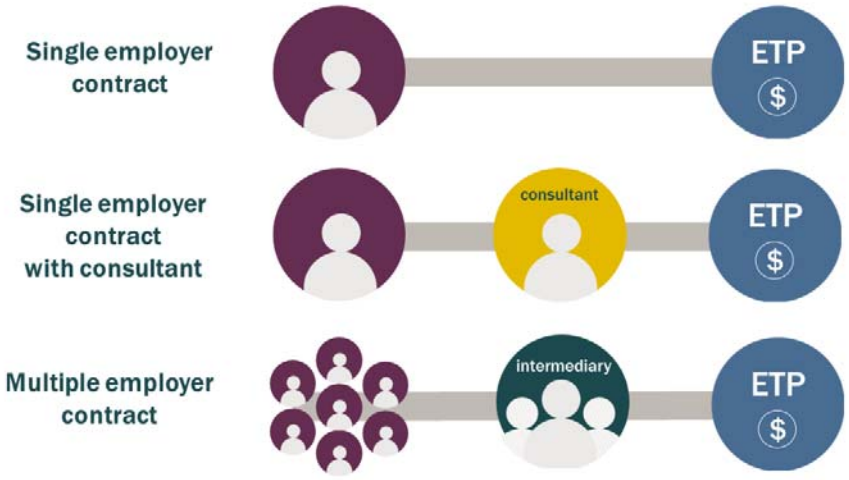
66%

of approved ETP funds (by value) are administered through single-employer contracts.

Source: ETP administrative data, 2014-2016.

[12] California Unemployment Insurance Code, Section 10200(a)(1)-(4).
[13] See California Unemployment Insurance Code, Section 10205.

Figure 1: Different ways in which ETP contracts are structured



ETP provides flexibility to employers to choose the training providers they want and, to some extent, to choose the type of training – although the eligibility rules and reimbursement rates vary by type. ETP allows employers to be reimbursed for classroom-based training, training off-site (e.g., at a community college or third-party provider), online training, and on-the-job training.[14]

The administrative process for single-employer applicants includes the initial application, contract drafting and approval, monitoring and reporting, and reimbursement. Users initially apply for ETP online, and then an ETP field staff member assists them with the full application, which was paper based at the time when the data were collected. The application requires that the user document the training plan, a justification, and the expected wage increment, among other things. Because the process is complex and it can be difficult to interpret how the program's rules apply to a specific company's application, many single-employer applicants hire third-party consultants who are familiar with the program for assistance.

On average, the decision process from pre-application to final contract takes 2-4 months. For applications over $75,000, the eight-member Panel makes the final decision about which contracts will be funded.[15] The Panel takes several factors into consideration, such as the training plan, wage and benefit levels, whether it is in one of 10 priority industries,[16] whether the company employs veterans or other special populations, whether the company is in a high unemployment area, and previous performance on ETP contracts (for repeat applicants).

Applications for MECs are managed through the same basic process, but the applicant is a third-party (herein referred to as an "intermediary") – such as an industry association, community college, labor organization, Joint Apprenticeship Training Committee (JATC), or workforce board. The intermediaries then either subcontract to employers in smaller amounts (providing easier access for small and mid-sized employers) or provide training directly through an apprenticeship program with students who are also employed.

[14] We use the terms "online training" and "on-the-job" training instead of ETP's terms of "computer-based training" and "productive lab," respectively, to make the report more accessible to a wide audience.

[15] The executive director has the authority to decide on applications requesting less than $75,000.

[16] The 10 priority industries are agriculture, allied healthcare, biotechnology and life sciences, construction, green/clean technology, goods movement and transportation logistics, information technology services, manufacturing, multimedia/entertainment, and technical services.

Once the contract is approved, users submit a list of trainees and then submit reports to document training hours completed, which can be done in hard copy or electronically with an approved learning management system. ETP was upgrading its information systems to migrate more of the process online and make it more user driven. Typically, each contract covers a period of 1.5 to 2 years, and many companies return for additional contracts once the first contract is completed.

Funding structure

ETP operates its core program through the two contract mechanisms described above. Funding comes from the Employment Training Tax, levied on employers alongside unemployment insurance taxes. In addition, the state has provided additional funding to support alternative programs (see box below).[17]

Funding for ETP programs is disbursed based on a pay-for-performance model, meaning that employers do not receive funding until they demonstrate successful performance. Performance is assessed through completion of training hours, completion of all planned training, and retention in employment at a well-paying wage rate[18] after 90 days.

ETP funded an average of

388

contracts for training per year.

The average value of each training contract was

$208,165

ETP approved training contracts worth a total of

$80.7 million

per year, on average.

ETP approved

106,376

incumbent workers to train in 2016–2017.

Source: ETP annual reports, 2012-2017.

ETP's alternative programs

ETP has increased emphasis on administering special programs since the 2007-2009 recession. Some of these programs target special populations, such as programs to provide work experience to at-risk youth. Others target issues of statewide importance, such as the 2014 California Drought Relief Employment Training Program, which was funded through the state's General Fund. These initiatives allow ETP to collaborate with other partners in the workforce system (e.g., community colleges and workforce boards) and support emerging and innovative models of training. They also allow ETP to support incumbent worker training in the public-sector workforce, such as in transportation agencies.

AB 118 Alternative and Renewable Fuel and Vehicle Technology Program

In 2009, ETP began a training program to support state legislation (AB 118), the Alternative and Renewable Fuel and Vehicle Technology (ARFVT) Program in partnership with the California Energy Commission. The purpose was to support the development of cutting-edge workforce skills in alternative fuel and clean vehicle technologies in the state. Through AB 118, ETP boosted support to companies in the ARFVT sector for workforce training and invested in training at public transportation agencies.[i] In addition, AB 118 funds allowed ETP to support the Zero Emission Vehicle initiative of the Brown Administration. Since 2010, ETP has awarded 45 contracts, worth $15.6 million, to train 9,995 workers.

[i.] Orenberg, 2017.

[17] For a current list, see the ETP website: https://etp.ca.gov/program-info-2/pilots-and-guidelines/

[18] The wage rates for meeting performance goals are specified in each contract before approval.

Characteristics and use of ETP-funded contracts, companies, and trainees

Many employers and key informants felt that ETP provided more support for incumbent worker training than any other government program in California, which is an indicator of how much they valued the program and what sets ETP apart from other programs in the state. All informants were generally supportive of ETP's mission and called it a win–win for employers and workers.

Each year in 2012–2017, ETP approved an average of 388 new contracts for training, approved new contracts totaling an average of $80.7 million per year, and trained an average of 85,703 trainees.[19] The average value of each training contract was $208,165 overall. The number of approved trainees varied widely from year-to-year but increased from roughly 62,000 in 2012–2013 to over 100,000 in 2016–2017—a trend associated with a significant increase in the total funding for approved contracts.

ETP's apprenticeship programs

Since 2012, ETP has increased funding for apprenticeship training through a special initiative (see graph to the right that shows growth in funding and in the number of apprenticeship trainees). The apprenticeship training model combines on-the-job training with classroom instruction and is predominantly used in the construction sector in California. ETP funds both Joint Apprenticeship Training Committees (JATCs)[i] as well as Unilateral Apprenticeship Committees (UACs) that are registered with the California Division of Apprenticeship Standards (DAS).

Compared to all contracts, apprenticeship contracts tend to have a higher amount of funding per approved trainee ($1,625 vs. $381) and a higher rate of trainees receiving training compared to planned (92 percent vs. 69 percent for all contracts).[ii] More recently, ETP has explored ways to support the development of nontraditional apprenticeship programs, in an effort to address the need for more vocational and technical training and mid-level technical skills in fields such as information technology, healthcare and advanced manufacturing.

Source: "ETP apprenticeship database, 2012-2017".

[i] JATCs are labor-management committees that jointly administer apprenticeship training.

[ii] Note: the rate of trainees achieved for apprenticeship contracts is for 2012-2017; whereas the rate of trainees achieved for all contracts is for 2014-2016. These averages are not regression adjusted (they do not control for the influence of company characteristics.)

[19] See ETP Annual Reports, 2012–2017. Available from: https://etp.ca.gov/about-us-2/annual-reports/.

Between 2012 and 2017, 98 percent of the total value of new contracts funded core programs, while only 2 percent funded alternative programs. ETP funded an average of 383 new contracts for core programs per year, for an average total value of $78.9 million per year; the average contract value was $206,155. Over the same period, ETP funded an average of 6 alternative contracts per year, for an average total of $1.9 million per year and an average contract value of $353,306. Although the share of alternative contracts was small, the average value was higher because they were administered through MECs.

Below, we supplement this overview of ETP contract characteristics based on ETP annual report data with results from a more detailed analysis of ETP's administrative data. Note that the analysis below is based only on contracts that started and finished between 2014 and 2016.

Detailed Analysis of ETP-funded contracts

As stated earlier, ETP funded 88 percent of participating companies through MECs, but 66 percent of the annual value of ETP funds were administered through single-employer contracts.[20] This is because MECs administer ETP funds to multiple employers in smaller amounts, whereas companies applying to ETP for larger amounts go through a single-employer application. Staff reported that ETP had increased use of MECs in the last six years in an effort to coordinate with other workforce programs and increase access for small and mid-sized companies. Figure 2 on the next page provides a snapshot of all companies using ETP contracts between 2014 and 2016.

As Figure 2 shows, almost half of participating companies declared construction as their primary industry, followed by manufacturing and technical services. This is because many MECs were operated by construction unions. The number of companies that participated in each MEC varied widely.

The types of companies that participated in ETP through MECs were qualitatively different from those that participated through single-employer contracts (Figure 3). Companies accessing ETP through single-employer contracts tended to be larger (about half had 250 employees or more). Almost half were in the manufacturing sector, followed by technical services (11 percent) and wholesale/distribution (10 percent). MEC companies, on the other hand, tended to be smaller (fewer than a quarter had 250 employees or more), and 44 percent were in construction.

Companies participating through single-employer contracts and MECs were very different from each other:

Companies accessing ETP through single-employer contracts tended to be larger and more were focused on manufacturing.

Companies accessing ETP through MECs tended to be smaller, and roughly half were in the building trades.

ETP supports high-quality jobs by setting wage requirements for reimbursement.

The average post-program wage was:

$29.29/hour

for incumbent workers, and

$13.78/hour

for new hires.

Source: ETP annual report, 2016–2017.

[20] ETP administrative data, 2014–2016.

Figure 2

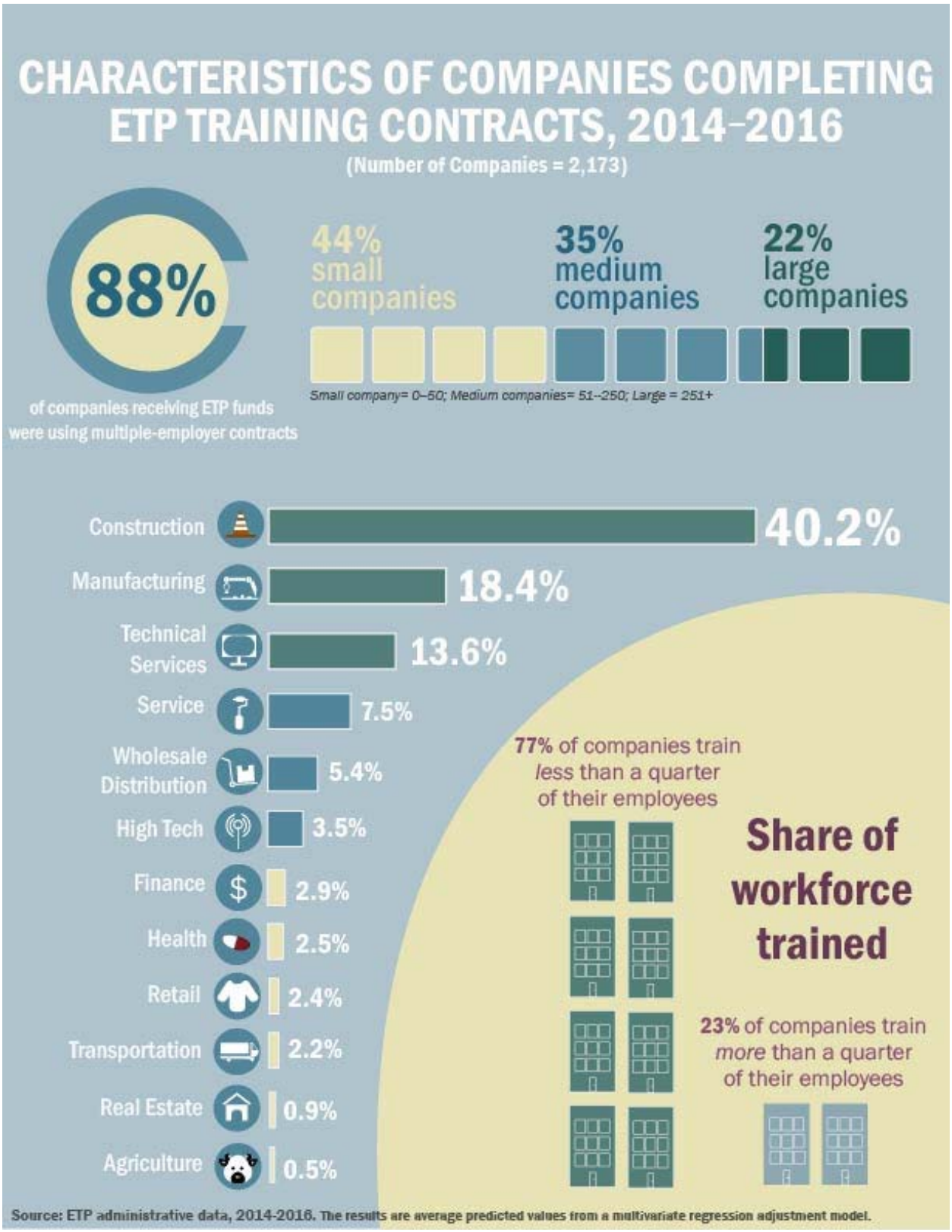
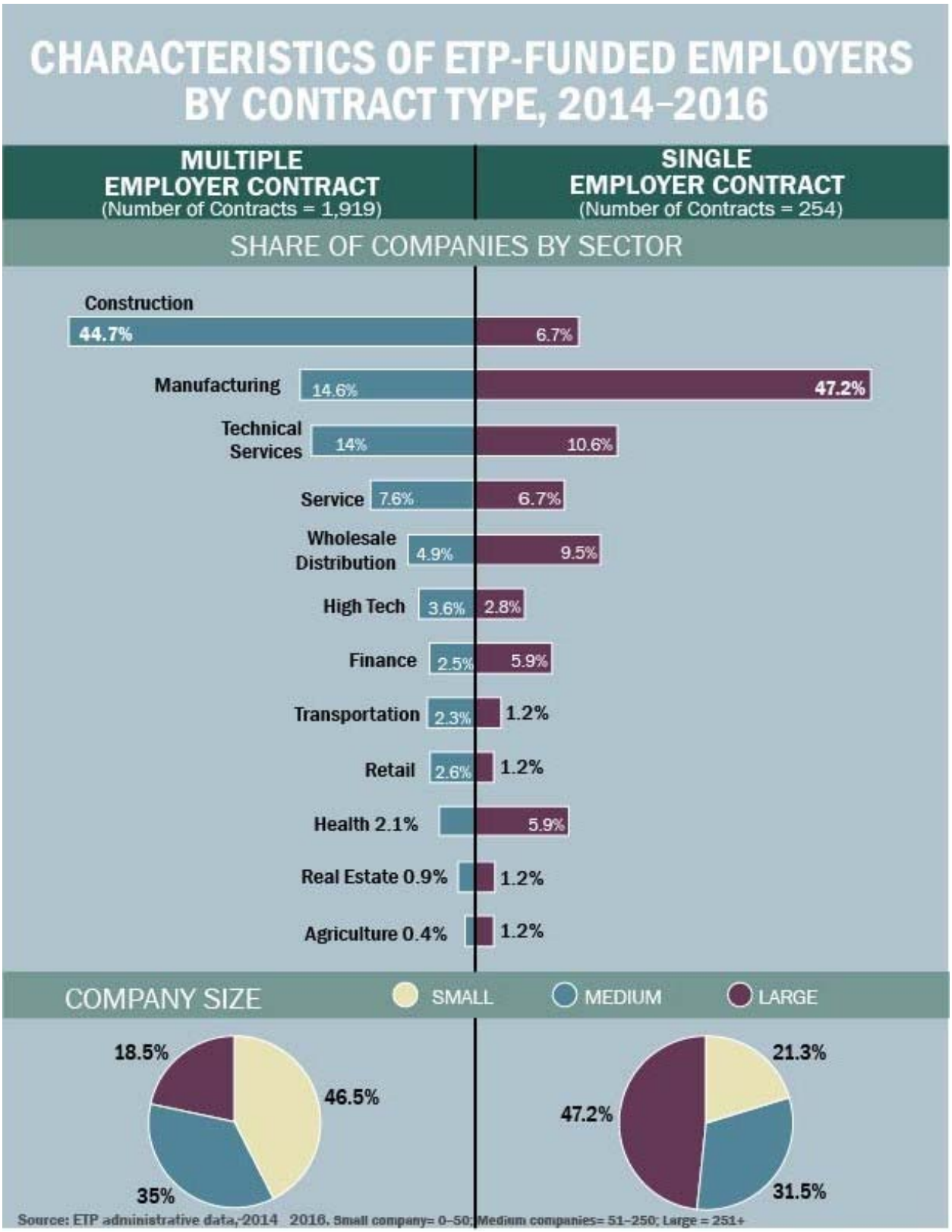

CHARACTERISTICS OF COMPANIES COMPLETING ETP TRAINING CONTRACTS, 2014–2016
(Number of Companies = 2,173)
88%
of companies receiving ETP funds were using multiple-employer contracts
44% small companies
35% medium companies
22% large companies
Small company= 0–50; Medium companies= 51--250; Large = 251+
Construction 40.2%
Manufacturing 18.4%
Technical Services 13.6%
Service 7.5%
Wholesale Distribution 5.4%
High Tech 3.5%
Finance 2.9%
Health 2.5%
Retail 2.4%
Transportation 2.2%
Real Estate 0.9%
Agriculture 0.5%
77% of companies train less than a quarter of their employees
Share of workforce trained
23% of companies train more than a quarter of their employees
Source: ETP administrative data, 2014-2016. The results are average predicted values from a multivariate regression adjustment model.

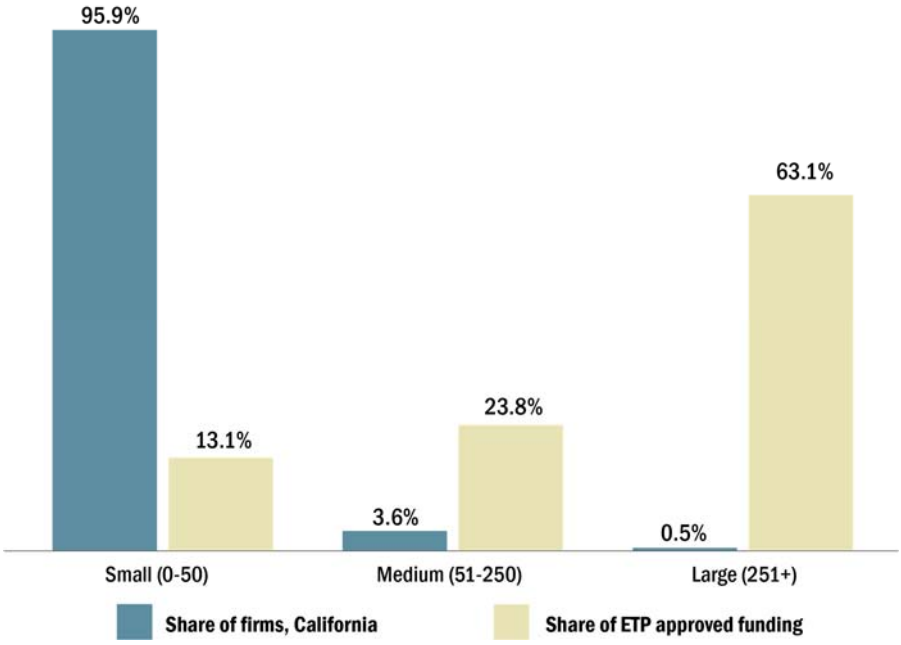
Figure 3


CHARACTERISTICS OF ETP-FUNDED EMPLOYERS BY CONTRACT TYPE, 2014–2016
MULTIPLE EMPLOYER CONTRACT
(Number of Contracts = 1,919)
SINGLE EMPLOYER CONTRACT
(Number of Contracts = 254)
SHARE OF COMPANIES BY SECTOR
Construction
44.7%
6.7%
Manufacturing
14.6%
47.2%
Technical Services
14%
10.6%
Service
7.6%
6.7%
Wholesale Distribution
4.9%
9.5%
High Tech
3.6%
2.8%
Finance
2.5%
5.9%
Transportation
2.3%
1.2%
Retail
2.6%
1.2%
Health 2.1%
5.9%
Real Estate 0.9%
1.2%
Agriculture 0.4%
1.2%
COMPANY SIZE
SMALL
MEDIUM
LARGE
18.5%
46.5%
35%
21.3%
47.2%
31.5%
Source: ETP administrative data, 2014–2016. Small company= 0–50; Medium companies= 51–250; Large = 251+

How funds are distributed to companies in ETP's programs

Between 2014 and 2016, 2,173 companies participated in ETP. In these years, 22 percent of ETP participating companies were large, 35 percent were mid-sized, and 44 percent were small companies.[21] Most of ETP's approved funding, however, was allocated to large companies in the 2014-2016 period (63 percent), followed by 24 percent for mid-sized companies and 13 percent for small companies. This distribution of approved funding by company size was skewed in a direction that was opposite to how companies were distributed in California generally (Figure 4). According to EDD labor market data, in 2015, 96 percent of California businesses were small, 4 percent were mid-sized, and 0.5 percent were large.[22]

Figure 4: Distribution of ETP approved funding by company size versus the size distribution of companies in California



Sources: ETP administrative data for completed contracts, 2014-2016, and State of California Employment Development Department: Size of Business Data for California, 2015 Q1.

Although more of ETP's contracts were concentrated in the construction industry (Figure 3), the highest share of the funding went to the manufacturing sector.[23] On average, from 2012 to 2017, ETP approved 40 percent of new core funding for contracts in the manufacturing industry, distantly followed by construction (15 percent), high-tech and technical services (12 percent), and healthcare (10 percent).[24]

How employers use ETP as part of a broader company training strategy

ETP tended to play a smaller role in the overall training strategy at larger companies interviewed for the assessment than it did for smaller companies. Informants at large employers and labor organizations did not see the funding as part of their core training model because they felt that the pay-for-performance structure introduced too much risk. Instead, they used ETP funds to offer additional training to enhance

[21] ETP administrative data, 2014–2016.
[22] State of California Employment Development Department, *Size of Business Data for California, 2015 Q1*.
[23] The discrepancy is due to the fact that more companies participate in ETP through the MECs (predominantly in construction), but more funding is approved through single-employer contracts, which is concentrated in the manufacturing sector (Figure 3).
[24] ETP Annual Reports, 2012-2017.

their competitiveness—in particular, innovative types of training, training on new technologies or production methods, and more comprehensive sequences of training in pathways that helped them keep workers motivated and satisfied with their careers.

> *The bulk of [our company's] training money is spent on handling day-to-day things. ETP is spent on special projects that have some regional importance.*
>
> —Large employer

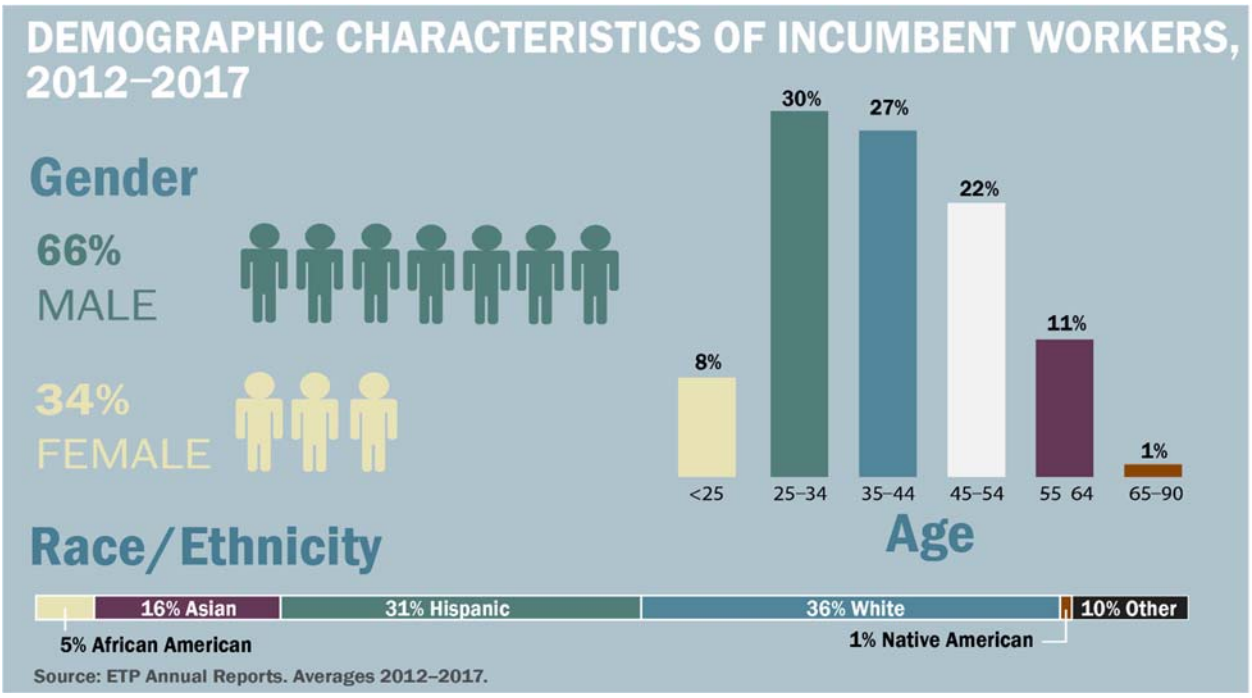
Mid-sized employers and labor organizations reported that ETP funds had been instrumental for facilitating expansion. Given the relatively small size of these companies and union-led apprenticeship programs, the funding made up a more significant share of their overall training budgets. For example, one labor organization informant noted that ETP funding was critical to its apprenticeship program's survival following the recession, when funding from other sources was cut.

Characteristics of trainees who receive ETP-funded training

Almost all individuals who received ETP-funded training (99 percent) were incumbent workers. Figure 5 shows that most incumbent workers who were trained with ETP funding were between 25 and 54 years old, and two-thirds were white or Hispanic.

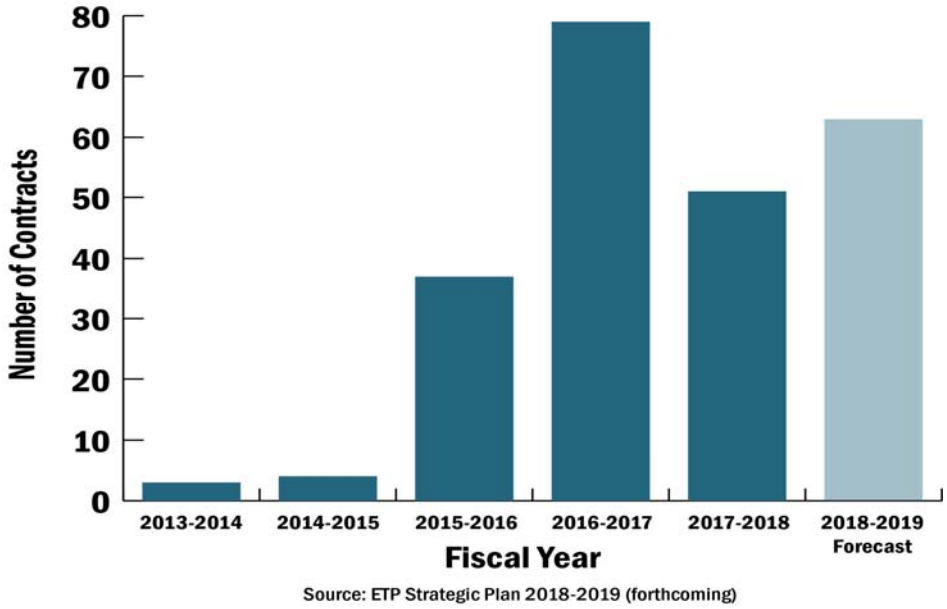
Women were underrepresented among ETP trainees; on average, nearly two-thirds of the incumbent workers trained through ETP-funded programs were men (Figure 5). This is most likely because the industries and sectors in which many ETP-funded companies operated, such as manufacturing and construction, tend to have a disproportionately male workforce. In 2012–2013 ETP funded a higher share of training in healthcare, which has a female-dominated workforce. In that year, the share of women receiving ETP-funded training increased to 44 percent.

Figure 5



Recently, ETP has prioritized access to training for certain target populations, such as veterans. One way it has done so is by reimbursing employers at a higher rate for delivering training to these groups. Figure 6 below shows trends in the number of approved contracts that train veterans. The chart indicates a significant increase in the number of contracts with veteran trainees over time.

Figure 6: Approved Veteran Contracts



4. Outcomes of ETP

This section summarizes our findings on ETP outcomes and provides suggestions for enhancing the data and for designing future studies. (See Appendix A for more detail.) We also gathered qualitative information from the interviews about how employers and labor organizations perceived ETP's outcomes and impacts, and we share those findings at the end of this section.

Outcomes analysis

The analysis of ETP administrative data from 2014–2016 allowed us to calculate some program outcomes at both the company and contract level.[25] On average, companies trained about 20 employees, representing a little more than one-fifth of their workforce. Participating companies that have successfully completed a contract trained, on average, more than two-thirds of the individuals they intended to train.

SPR used a multivariate regression model to investigate how the mode of participation in ETP (such as type of contract) was associated with a variety of company-level outcomes. We controlled for company-level characteristics to improve the precision of our estimates.

Company-level outcomes:

Average number of trainees per company

19.4

Average share of workforce trained

21.1%

First, we examined what factors shaped the share of a company's workforce that receives ETP-funded training (Figure 7).[26] The regression model[27] estimated that the following factors were associated with a higher share of a company's workforce receiving training:

- Being a small company
- Having a higher rate of labor turnover
- Being in the manufacturing, construction, or healthcare industry

Next, we analyzed what factors drove a successful training achievement outcome—measured as the percentage of trainees who complete training[28] compared to the initial number of individuals approved to train. We could only analyze this outcome at the contract level (in which all MEC companies were grouped together as one contract) due to the structure of the data.

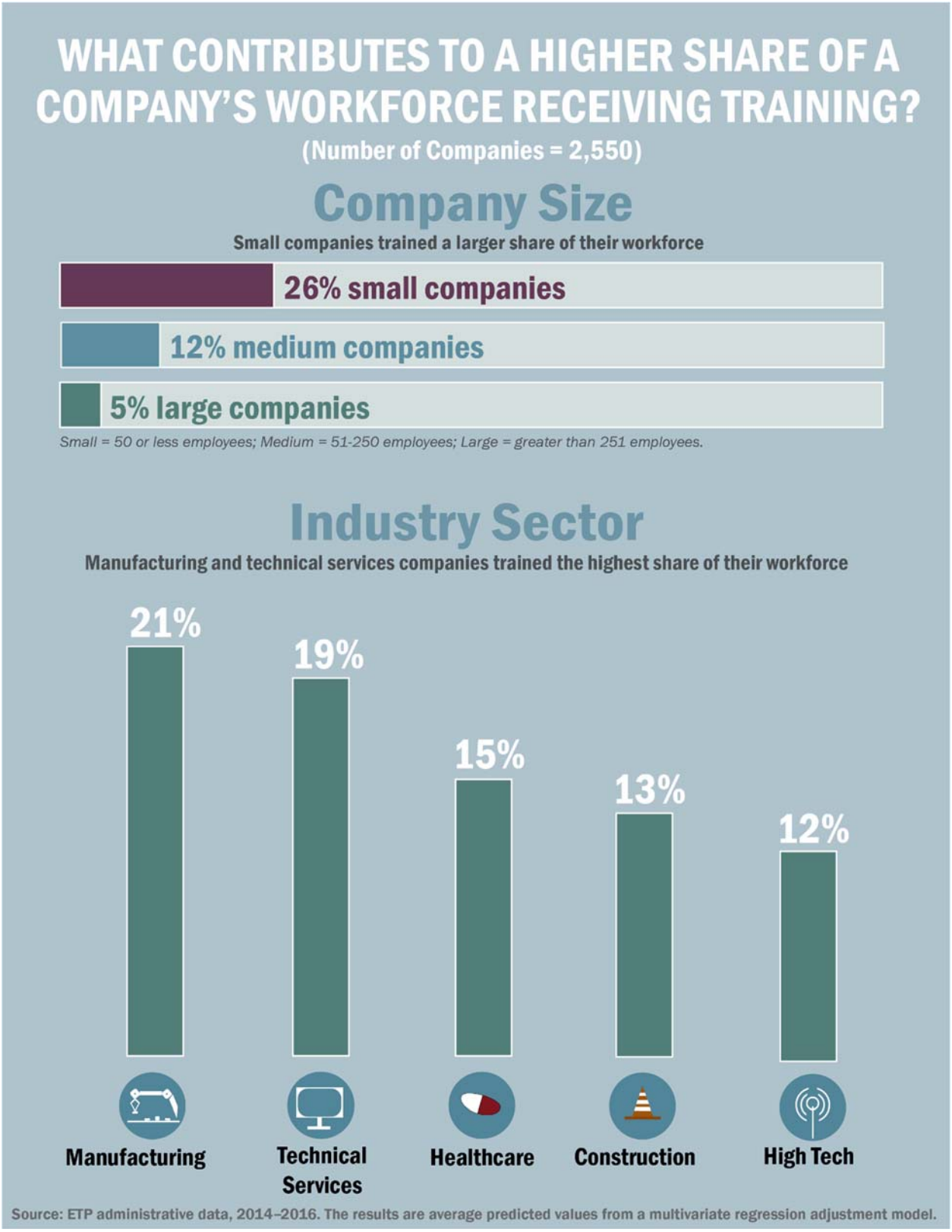
[25] The data that ETP shared with SPR do not include companies that were approved for training but failed to complete it ("terminated" contracts). Without these data, we could not analyze the factors that influenced successful contract completion.

[26] This outcome indicator was chosen rather than just the number of trainees because the number of trainees is difficult to compare across companies of widely differing sizes.

[27] This model was estimated as a fractional regression model where the dependent variable was the proportion of trainees among the total number of employees in the company. Details about all outcomes regression models are offered in Appendix A.

[28] ETP refers to this measure as "placement," but we use "training achieved" because almost all of the trainees are incumbent workers.

Figure 7


WHAT CONTRIBUTES TO A HIGHER SHARE OF A COMPANY'S WORKFORCE RECEIVING TRAINING?
(Number of Companies = 2,550)
Company Size
Small companies trained a larger share of their workforce
26% small companies
12% medium companies
5% large companies
Small = 50 or less employees; Medium = 51-250 employees; Large = greater than 251 employees.
Industry Sector
Manufacturing and technical services companies trained the highest share of their workforce
21%
19%
15%
13%
12%
Manufacturing
Technical Services
Healthcare
Construction
High Tech
Source: ETP administrative data, 2014–2016. The results are average predicted values from a multivariate regression adjustment model.

As shown in Figure 8, the following factors were associated with higher rates of training achieved among employers that completed a contract:[29]

- Participation in a MEC (vs. a single-employer contract)
- Higher spending per approved trainee
- Being a small or mid-sized company (fewer than 250 employees)
- Low labor turnover (not shown in Figure 8)

On average, companies succeeded in expending and getting reimbursed for

80%

of the funding that ETP initially approved for their contract.

Source: ETP annual reports, 2012–2017

On average, MECs achieved more of the training goal they planned, and in fact trained more employees than they had planned to train. Most likely, MECs could more easily achieve this outcome because MEC administrators (intermediaries) were able to replace employers that were not achieving training outcomes with others that did. Spending per approved trainee also appears to be positively associated with training achievement rates.[30] For completed contracts, companies were not able to spend, on average, 20 percent of the funds that ETP had allocated.[31]

Companies that successfully completed a contract trained

69%

of the individuals they intended to train.

Source: ETP administrative data, 2014-2016.

Labor turnover is often used as an indicator of poor management or a negative working environment, because workers happy with their jobs are more likely to stay. High labor turnover can be very costly because of the investment firms make in developing the occupational knowledge and skills of employees.[32] ETP-funded companies with greater than ten percent labor turnover trained 19 percent of their workforce; whereas those with labor turnover less than ten percent trained a smaller share of their workforce (14 percent). This suggests that high turnover companies may have been using ETP funds to compensate for the knowledge and skills they lose when employees depart. That said, ETP-funded companies with turnover lower than ten percent were able to train 75 percent of the workers that they initially intended to train; while those that had turnover over ten percent only accomplished 62 percent of planned training. This indicates that companies with turnover above ten percent were either struggling to effectively forecast and plan training or to successfully document completed training so that they can get reimbursed.

These findings indicate that ETP may play a useful role in providing more capacity building, guidance, and management training to companies with labor turnover higher than ten percent and low training achievement rates. This may help enhance ETP's effectiveness in meeting the legislative goal of supporting human resources to increase quality and productivity, as well as the goal of fostering the creation and retention of high-wage, high-skill jobs in California.

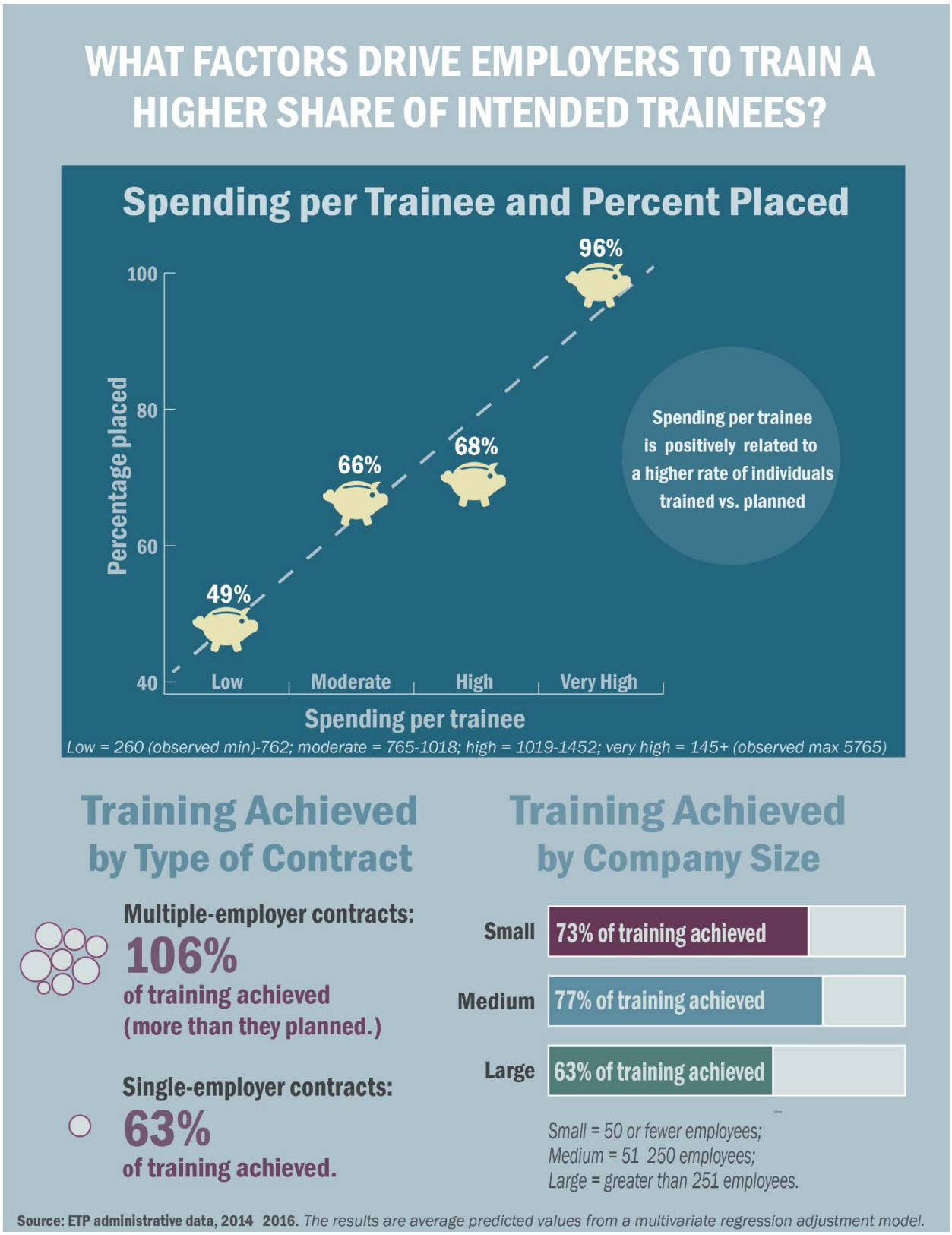
[29] Estimated using a general linear model with log transformation (see Appendix A).

[30] We calculated the average spending per approved trainee and divided it into four quartiles, Q1–Q4. The outcomes model indicates that contracts in Q1 (lowest) achieve only 50 percent of training completion goals, whereas contracts in Q4 (highest) achieve close to 100 percent.

[31] See ETP annual reports (https://etp.ca.gov/about-us-2/annual-reports/).

[32] Note: companies with a labor turnover rate 20 percent or above are not eligible to apply for ETP without additional justification.

Figure 8


WHAT FACTORS DRIVE EMPLOYERS TO TRAIN A HIGHER SHARE OF INTENDED TRAINEES?
Spending per Trainee and Percent Placed
Percentage placed
100
80
60
40
96%
68%
66%
49%
Low
Moderate
High
Very High
Spending per trainee
Spending per trainee is positively related to a higher rate of individuals trained vs. planned
Low = 260 (observed min)-762; moderate = 765-1018; high = 1019-1452; very high = 145+ (observed max 5765)
Training Achieved by Type of Contract
Multiple-employer contracts:
106%
of training achieved
(more than they planned.)
Single-employer contracts:
63%
of training achieved.
Training Achieved by Company Size
Small
73% of training achieved
Medium
77% of training achieved
Large
63% of training achieved
Small = 50 or fewer employees;
Medium = 51 250 employees;
Large = greater than 251 employees.
Source: ETP administrative data, 2014 2016. The results are average predicted values from a multivariate regression adjustment model.

User perceptions of the benefits of ETP participation

Employers and labor organizations reported a wide array of benefits from participation in ETP. Several employers noted that the funding helped them develop more sophisticated internal systems for training, such as supporting their investments in a learning management system (LMS), career ladders and pathways, and new equipment. One large employer described how ETP enhanced internal training systems:

> *The amount of money we get back covers the cost of having an LMS, just having the system. It gives us the ability to have a state-of-the-art system. It also makes us focus on training. We have to take time to capture records and to look at what actually happens. We are pulling the data, and we wouldn't be looking at it so carefully as we do [because of ETP].*

Other users said that ETP funding enabled them to stay competitive by adapting to the latest technologies, reduced risk of quality or safety failures, and allowed them to bring in specialized training as needed.

> *I would say that ETP has given us more competitiveness—ensuring quality and consistency, which ensures our freedom to operate. In some ways, it is risk aversion. It helps us show to a regulatory agency that we have a system that is consistent and that works.*
>
> —Mid-sized employer

Employers from small and mid-sized companies tended to report more significant effects from ETP participation, while several large employers noted it would be hard to isolate the effects of ETP funding from the effects of other training activities. However, they reported a wide array of benefits from participation and shared positive feedback overall. For example, one labor organization informant said he did not count on ETP funding to survive, but it had enabled their apprenticeship programs to keep pace with rapid technological changes and allowed them to train apprentices in cutting-edge technologies.

At the same time, fast-growing mid-sized companies and labor organizations that were seeking to expand in response to high demand indicated that ETP had a significant effect. One labor organization attributed its geographical expansion to ETP, because it allowed the organization to run classes in more rural parts of the state, such as Eureka and Fresno, that previously did not have access. One mid-sized employer felt that ETP was critical to expansion:

> *What [ETP has] done is it has helped us try to become the employer of choice for people who are looking for a job.…At the start of the contract, in 2016, sales were $30 million. By the end of 2017, they were at $42 million. We attribute that to the ETP program.…This is our 35th year in business, and we had a 40 percent increase in revenue—that's the first time we've seen that kind of revenue growth. We had 169 employees on the agreement when we started in 2016. In the most recent application, we had 334.*

The responses from intermediaries and ETP staff who worked with many users on a day-to-day basis confirmed these findings. They also noted that ETP participation tended to have a particularly strong organizational effect on small and mid-sized companies because it requires them to document their training plans and formalize their internal training systems, whereas previously training was very informal and ad hoc.

Most users also reported positive outcomes for their workforce. For example, large employers emphasized that ETP-funds helped them offer enhanced training opportunities and career paths, which had the added benefit of motivating employees and increasing retention.

We do it because the employees get motivated when they come and take classes.

—Large employer

We find that if we build our current workforce and really empower them to provide care, they tend to be more loyal with the company. Services are better, patient satisfaction is higher, turnover rate is lower in general when the staff feel that the company has opportunities for them to grow while staying in the organization.

—Large employer

A labor organization reported that frontline workers received a certificate following training and a small bonus after the exam. The certificate empowered employees to negotiate a salary increase when their contracts were up for renewal. The informant also observed that ETP-funded training was changing employers' perceptions of frontline workers: They no longer saw them as unskilled and disposable.

ETP staff and intermediaries confirmed findings from user interviews. They observed that ETP-funded training allowed employers to communicate more effectively to the workforce that they were invested in their professional growth; in many cases, it enabled workers to benefit from more defined internal career ladders and pathways. Several felt that it was a "win–win" situation because, even if employees lost their jobs after the training, they were in a better position to find new jobs more quickly. More research is needed to learn how trainees themselves perceive the benefits of training that is supported by ETP.

5. How can ETP promote continuous improvement?

We analyzed data from key informant and user interviews to understand how they perceived ETP and how they felt the program could improve. All the informants were supportive of ETP's mission and said the programs are moving in the right direction, though they generally found some administrative processes to be outdated and burdensome. They felt that the pay-for-performance structure was helpful for ensuring that the program supports high quality jobs, but they also felt it was a barrier to participation for small and mid-sized firms and to attracting additional intermediaries to operate MECs.

Feedback on ETP and its administrative processes

Many employers and intermediaries shared that most employers in California are not aware that ETP exists or if they are eligible for it. They also said that many employers experienced especially significant challenges accessing the program the first time they applied, but that it became easier as they learned how it worked. Further, they shared that some employers were confused about the degree of flexibility in ETP's rules (e.g., which rules they could negotiate and which were inflexible), and some did not understand that they can be reimbursed for training that is not on-site classroom training, such as training at a community college or on-the-job training. Despite these challenges, some users said they had referred other employers to the program because they felt that it was valuable.

Staff and intermediaries were in general agreement that administrative processes impeded ETP from meeting its full potential because some rules and systems were outdated and inefficient. Although they understood that the program must have compliance requirements, they felt that some of the compliance mechanisms could be updated to be more user-friendly. More generally, they felt that ETP's focus on compliance came at the exclusion of other aims, such as broader access to funds and technical assistance for small and mid-sized firms. By contrast, user informants were less critical in their overall assessment of ETP's administrative process because they expected to have to go through some such processes to access government funds. They generally appreciated the flexibility that ETP provided in terms of choosing a

training provider that suited their needs, although some remarked that some of ETP's processes did take a long time and that ETP staff often were too busy to assist as much as needed.

> *Overall, there is a process to everything—sometimes it takes a long time. Many times, we've provided training without being approved yet or being able to bill.*
>
> —Labor organization

> *Generally, it can sometimes take a lot of time to get answers. [ETP staff members are] really busy—it can be hard to get resources when you need them. But it's a very positive program overall.*
>
> —Employer

Despite these criticisms, several users reported that the agency was becoming more flexible in interpreting rules, which they appreciated because it allowed for more customization to their needs. Many users also noted that the administrative processes had become more streamlined and efficient in the last few years.

> *They've enhanced the system for data collection and submission. People are approachable, and they've been flexible with us to work with us and meet our needs.*
>
> —Employer

Overall, users recommended that ETP continue to work on making its administrative process more user-friendly, including:

- Making it easier for applicants to complete the process without the assistance of a third-party consultant or industry association,[33]
- Making it easier to use the MEC structure,
- Clarifying the rules and how much flexibility is allowed when they are enforced.

Informant perspectives on the pay-for-performance funding structure

Informants were generally supportive of the fact that ETP focuses on high-wage, high-quality jobs through the pay-for-performance funding structure. In practice, however, this funding structure meant that users (employers and third parties operating MECs) applied for funds to train workers but had to make the upfront investment to implement the training. They did not get fully reimbursed for training until after it was completed and the 90-day retention period was over (and they were only reimbursed for training that met the performance measures).

> *Everyone involved in ETP should begin to understand that the training in the contract and documented in hours and uploaded is not the training that ETP dollars are spent for. What ETP does is pay forward for another batch of training that occurs in the future. It must be financed by someone other than ETP.*
>
> —Third-party consultant

[33] At least three employers who had used third-party consultants or industry associations to apply for ETP or report training hours said that they would prefer to be able to do this work in-house because those consultants/industry associations did not know the details of the program well enough.

Users thus risked losing the upfront capital they had invested. This process can create a barrier to access for small or mid-sized firms, which is one reason ETP increased the use of MECs. However, key informants reported that this risk could also be a barrier to finding new intermediaries willing to administer MECs.

> *As a MEC, we are the bankers. We're providing all that cash up front and taking a huge risk. And if ETP has grey areas [in the rules], we stand to lose thousands of dollars, if not shut our program down. I think it's too extreme. It's limiting who wants to get into the game.*
>
> —Intermediary operating an MEC

These findings suggest that there is a tension between the goal of directing funding to employers who demonstrate successful performance and the need to reduce barriers to access (and increasing partnerships to facilitate access).

6. Emerging practices and partnerships

ETP staff members reported that, over time, ETP increased use of MECs. Staff and intermediaries praised ETP for using MECs to expand partnerships and said this had been critical for making the program accessible to small and mid-sized employers. Likewise, it enabled ETP to support the development of new initiatives in workforce training in California. Informants wanted to see continued collaboration and expansion of MECs but noted that the pay-for-performance structure and administrative complexity of applying to ETP were still significant barriers to bringing in new intermediaries.

Several promising practices had emerged, mainly through the MEC structure, such as the innovative training programs noted earlier. In addition, ETP had expanded partnerships with community colleges (see below), local workforce boards, and others to operate new MECs.

Staff and intermediaries praised ETP for expanding partnerships, because they have been critical for making the program accessible for small and mid-sized companies and has enabled ETP to support innovative training models.

Promising practice: Increased collaboration between ETP and community colleges

In 2015, several community colleges in California increased collaboration with ETP by creating the California Community College ETP Collaborative.[i] According to a community college informant, more than 22 colleges were active in this collaborative across the state. Specific partnerships between ETP and community colleges developed as a result of this collaborative included:

- ETP's partnership with El Camino College in Torrance, California, to support an aerospace manufacturer in upgrading workforce skills.
- ETP collaborated with four community colleges to form the Advanced Transportation and Alternative Energy Program with funding from AB 118.
- ETP and Chaffey College collaborated to further support the InTech Center, a regional training center located on the campus of California Steel Industries in Fontana, California.
- ETP partnered with the College of the Sequoias to support the development of food safety and customized training in agriculture at the college's Training Resource Center.

The collaborative was recently renamed the Community College Contract Education Collaborative (CCCEC) and aims to continue aligning contract education in California across colleges, ETP, and the Deputy Sector Navigators in each region of the state.

[i]California Community Colleges, *Doing What Matters*.

However, as ETP sought to support innovative initiatives in workforce development, key informants also shared some of the challenges that arose:

- ETP staff sometimes lacked a sophisticated understanding of atypical training models, and this contributed to delays and inconsistent information shared with users about requirements and criteria for applying;
- ETP's administrative systems were not well designed for adapting to different use cases, so those using MECs and pursuing more innovative training models tended to experience more administrative barriers, which could make it harder to attract new MEC intermediaries and encourage innovative practices; and
- Informants appreciated the program's flexibility but described a tension between flexibility and streamlining. Users, staff, and intermediaries reported that they sometimes found it difficult to comprehend the rules of the program.

Employer perceptions of apprenticeships and how ETP can better support their development

There has been growing national policy interest in nontraditional apprenticeships. Nontraditional apprenticeship programs can be operated by unions but also by employers, community colleges, or other organizations; they are not necessarily "registered" apprenticeships with the state or federal government; and they are in sectors that have not typically used apprenticeship as a form of training, such as information technology or transportation. Since 2012, ETP has supported more traditional apprenticeship models in the trades. ETP has begun to support a small number of nontraditional apprenticeships, but they are all registered through DAS. ETP has sought to leverage the MEC structure to increase partnerships with entities that operate nontraditional apprenticeship programs.

Employer perceptions of apprenticeships varied, with some reporting that they were actively experimenting with nontraditional apprenticeships or were interested in implementing them, while others

(about one-third) expressed little interest in or excitement about apprenticeships. Employers mentioned additional challenges, including:

- A common perception among many employers that apprenticeships require labor unions and a high level of administrative paperwork to approve;
- A misperception that apprenticeships are only relevant to the building trades;
- A concern about how to monitor apprenticeships funded through ETP, because skill attainment and on-the-job training are more challenging to document; and
- A concern that having an apprenticeship would be too burdensome on the company (e.g., "We don't have the bandwidth for an apprenticeship").

Despite these stated challenges, several employers said they were either open to developing apprenticeships in nontraditional fields or already had international branches that operated on this model. Some smaller companies reported having on-the-job training that was very similar to an apprenticeship model but was not formalized.

Employer case study: demand for apprenticeship training in nontraditional sectors

One employer reported having a broad-based initiative at his company for developing and piloting new information technology apprenticeship programs for system administrators and database operators, and also described six other programs they were seeking to register in the future. These programs would all be competency based, and have systems in place for measuring how the learner achieves the desired competencies and skills sets via a mentor who assesses progress towards skill attainment with tests and practical evaluations. The company was developing these apprenticeships in part because it was seeking to develop a pipeline of high school graduates with IT skills and they had received a very promising response from students seeking to become apprentices.

> *For our apprenticeship, interest [from the workforce] has been phenomenal….People that we've hired are enthused about the program. They've over-achieved on [obtaining] digital credentials….The word is getting out there and we've had no trouble filling slots.*
>
> —Employer

Those users with more enthusiasm for nontraditional apprenticeships shared the following recommendations for how ETP and state workforce partners could enhance support for apprenticeships:

- Partner with community colleges for the classroom instruction component and have ETP fund the cost of the classroom training component of apprenticeships (called related supplemental instruction);
- Document skill attainment through industry-recognized micro-credentials (pre- and post-testing), practicums (e.g., writing a piece of code in IT), or performance of a task or procedure for a mentor to evaluate;
- Reimburse work-based learning through a competency-based, rather than hours-based, model;
- Encourage state and other government agencies to hire apprentices coming out of the programs;
- Leverage and harmonize ETP funding for apprenticeships with Workforce Innovation and Opportunity Act Title IB on-the-job training funds that workforce boards or their contractors administer (e.g., create a single application and compliance process);

- Communicate more about the rationale behind certain policies, such as the cap on the hours of on-the-job training,[34] because many informants said that they felt it was arbitrary.

7. Updating ETP to meet current and future training needs and methods

This section summarizes findings from the key informant and user interviews about workforce challenges and training needs, changing training delivery methods, and the value that employers place on credentials.

Workforce challenges and training needs

Some of the workforce challenges and training needs that employers reported were specific to an individual's role in the company or industry, but others appeared to affect ETP participants more broadly. The common challenges that employers reported stemmed in large part from generational and technological shifts. As the baby boom generation retires, employers need to prepare younger, less experienced generations to take their place. This translates into a greater need for supervisory and leadership training, more articulated internal career ladders and learning management systems, and a need for more skills training.

New technologies have been diffusing into industry sectors that have not previously widely used digital or automated systems. Required skillsets are shifting from those that lend themselves to routine tasks and tasks done by hand and in person, to those that allow employees to use technology to oversee multiple activities and interact with customers remotely. Multiple employers said they also invested in lean manufacturing training to increase efficiency, develop new production processes, and improve leadership skills.

Even users in non-technology sectors reported their work was changing dramatically, and that the pace of technological change was increasing. To deal with these changes, employers stated that they needed to train both their current workforce and new hires to be able to work better with technology—including having basic digital literacy. For example, some employers stated that they needed to train their entry-level workers on the use of Microsoft office packages, such as Excel. Others noted a need for their staff members to have basic programming skills and the ability to use electronic records systems efficiently. As one employer stated:

> *Earlier it was a choice [for new staff] to have digital fluency. Now all new hires have to have it.*
>
> —Large employer

Further, one manufacturing employer stated that because her company was developing an automated state-of-the-art facility that would produce four times the output with the same number of employees, she needed to retrain workers because their jobs would involve less hands-on work and more oversight. Several of these employers felt it was important to have an LMS in place for managing continuous improvement in the skills of their workforce.

Employers from sectors that were more advanced in their use of and reliance on technology reported slightly different workforce challenges. For them, the biggest challenges were keeping workforce skills cutting edge and retaining their highly skilled workforce.

[34] ETP refers to on-the-job training (work-based, non-classroom training with a mentor) as "productive lab."

Technology evolves so quickly. We're trying to keep up to be cutting edge. Our company's goal is to retain people.…We have to fight with other companies to get people we really want.

—Large employer

Overall, the rapid pace of technological change seemed to be affecting all companies, but informants indicated that smaller and non-technology companies needed to invest in workforce training and re-organize production while also bringing technical and management skills into jobs that previously did not require them. Larger companies and those with technology at the heart of their business tended to experience challenges retaining high-skilled workers and keeping workforce skills cutting edge. More research is needed to assess if these patterns hold true in a larger sample of companies.

Employer responses to workforce challenges: new approaches to delivering training

Although users of ETP programs reported that their training delivery methods were increasingly incorporating online components, [35] they also still placed a high value on classroom-based, in-person training and did not expect that to disappear. ETP staff and intermediary informants who worked with multiple employers confirmed that this was a broader pattern in their interactions with employer and labor organizations. Two noted that younger workers had a strong preference for online and blended training, so they expected to do more of it in the future.

Their attention span is more in-tune with YouTube, so we've started creating training videos and framing them for the millennial mindset.…We have internal quality folks who can create the videos—that will be the wave of the future.

—Employer

Most users we talked to use the vast majority of ETP funds to support in-house, classroom-based training, although some also brought in external trainers or sent workers to external providers such as community colleges. Very few used ETP funding to support online and on-the-job training, despite their increased adoption of online training components and work-based training. Their reasons included:

- A lack of awareness that those forms of training were eligible for reimbursement;
- A belief that the rules or reporting requirements were too strict or cumbersome to implement; and
- A view that reimbursement rates for online training were too low.

ETP staff and intermediaries corroborated these findings, suggesting a broader trend.

Enhancements to learning management systems

Several employers reported that ETP supported their efforts to build a more robust LMS to manage training and reporting activities; key informants who had worked with many employers confirmed this. Some larger, more technologically advanced companies reported shifting from an LMS to internal learning platforms, similar to Netflix, with channels, artificial intelligence, and micro-credentials. Most of these trainings were self-driven and provided suggestions about additional trainings employees might be interested in or that could help them advance in their selected career pathway. One informant was exploring augmented reality training, an interactive system that provides step-by-step instructions and information.

[35] ETP's terminology for online training is "computer-based training," but most respondents said that term is outdated and "online learning" is more appropriate.

Use of on-the-job training

Most employers had incorporated on-the-job training in their training strategy,[36] but the level of formalization for tracking skill progression varied considerably. Several reported an interest in building talent pipelines with people who had high school diplomas but not bachelor's degrees through apprenticeships or through a work-based training model that was like an apprenticeship. Whereas larger companies and companies that were required to meet high levels of regulatory compliance tended to have well-documented systems for tracking continuous learning and progress towards achieving competencies on the job, smaller companies tend to have more informal systems in place—such as checking in with an assigned mentor periodically to assess performance and improvement.

Possible updates or enhancements to ETP rules for online and on-the-job training options

Users reported that they typically did not use ETP funds to get reimbursed for the online and on-the-job training activities that they conducted. Several of the user informants and key informants recommended changes to how ETP administers reimbursements for these forms of training to increase awareness and make them more user-friendly, including:

- Updating the "computer-based training" and "productive lab" terminology used by ETP because those terms can come across to users as out-of-date, which may harm ETP's outreach and marketing efforts. They suggested alternative terms that are more recognizable to employers and workers today, such as "online learning," "e-learning," "work-based learning," and "on-the-job training";
- Distinguishing between online training that leads to a credential or micro-credential (e.g., a training that is aligned with OSHA) and/or that has curriculum approved through a degree-granting institution and online trainings that do not offer those quality controls.

Some employers—specifically small and mid-sized employers—expressed a need for more assistance finding good training providers and learning about training options or systems that could benefit them. One employer suggested that ETP or another government entity could help address information gaps about training providers by providing a platform for employers and trainees to rate their experiences with the providers and to explore the availability of nearby training providers by topic area. Two employers shared concerns that the third-party consultants and intermediaries who helped them with their applications did

[36] ETP's terminology is "productive lab," but informants widely said that "on-the-job training" was a more accepted term for training that occurs in the workplace with oversight from a mentor.

not always know or share full information about what types of training or providers qualify for reimbursement (or what the rules are) or provide unbiased guidance about which providers an employer should use.

Value of industry-recognized credentials

ETP users in different industry sectors varied greatly in terms of how much value they placed on industry-recognized credentials. In sectors where quality standards or health and safety regulations required a high level of harmonization of skill levels among their workforce, employers tended to have more widespread use of industry-recognized credentials and relied on them as a core part of their business model to ensure quality and to document to auditors that they had robust measures in place for meeting regulatory requirements. Examples of highly regulated industries in our sample included aerospace, food manufacturing, pharmaceuticals, and healthcare.

A labor organization in the building trades, a food manufacturing employer, and a pharmaceuticals employer reported using advanced certifications for technical qualifications as well, but said their use was very specific to the role of the individual and what they were required to know for their job. For instance, sometimes employers trained some of their workforce in certifications very specific to the equipment they had to use.

The industry sectors in our sample that appeared to place less value on credentials included some subsectors of manufacturing (those without stringent health and safety standards), technology, entertainment, and hospitality. Informants in these sectors said their training needs were very highly customized and/or customer-facing and were therefore difficult to standardize sector-wide. The types of certifications that users in these sectors said were potentially valuable were at the more basic level, such as customer service and project management.

Overall, the key informant interviews suggested that unless employers are required to have workers with certain credentials because a buyer or the government requires it, many are reluctant to require credentials because they feel that the work their employees do is too customized and not similar enough to what other employers need. Some staff and intermediaries suggested that underlying this reluctance is a concern that if you train your workforce in easily transferable skills, it could lead to poaching from competitor firms. Based on both the user and key informant interviews, employers in higher-skill fields tended to see training as a positive strategy for retaining their most valued workers; however, employers in lower-skilled industries tended to see it as a risk because enhancing broad-based skills increases the bargaining power of the worker in the labor market as a whole. This was consistent with the literature, which shows that employers

ETP users in different industry sectors varied greatly in terms of how much value they placed on industry-recognized credentials.

The most common certifications that employers reported were:

- Occupational health and safety training
- CPR, first aid, and emergency preparedness training
- Forklift operator certifications
- SERVSAFE (in food manufacturing)
- Quality control
- Lean manufacturing (Green Belt, Yellow Belt, etc.)

tend to bias training investments in their higher-skilled employees.[37]

8. Impact Study

Thus far, we have explored how companies and staff understood the benefits of ETP funds, how they deploy the funds to train incumbent workers, and the challenges they experienced in doing so. We learned that employers and other stakeholders perceived that ETP funding was administratively complex to access but generally added value for companies and workers. Employers and stakeholders reported that ETP funding expanded the training options available in larger firms, supported their efforts to modernize learning systems, and helped companies retain experienced and skilled workers. Small and mid-sized employers reported even stronger outcomes of ETP, sharing their perceptions that ETP enabled them to grow faster, establish or formalize career ladders and other forms of organizational learning, and upgrade their work processes with new technologies.

Subsequently, we sought to test whether these perceived benefits could be measured quantitatively, if they held true more broadly across a larger number of firms that received ETP funds, and to estimate the size and consistency of the impact for different types of firms. To do this, we conducted a quasi-experimental impact analysis of ETP training investments. In a quasi-experimental study, a comparison group is selected purposefully from available data sources such that it resembles the program (treatment) group as closely as possible. The comparison group serves as an estimation of what would have happened in the absence of the program (otherwise known as the counterfactual). The difference between the average outcomes in the two groups represents the program's average impact (the gains experienced by participants compared to a hypothetical status quo in which the program was not available).

Generally, investments in incumbent worker training are expected to generate several types of company-level improvements. Improved efficiency and quality/accuracy of the labor force are expected to increase labor productivity, and increased employee skills and knowledge are expected to increase competitiveness.[38] Both increased productivity and competitiveness might then be expected to result in higher revenue. In addition, incumbent worker training might be expected to create new jobs or to save existing jobs from being eliminated,[39] which can be expected to result in a larger number of employees. Based on these insights from the literature, we chose company size and sales as our main outcomes to estimate ETP's impact.

We used a propensity score matching methodology to compare the outcomes of a sample of companies that were funded by ETP in the 2017-2018 program year (the treatment group) with the outcomes of a comparison group of similar companies that did not receive ETP funding. We used data provided by Dun & Bradstreet (henceforth D&B) to select the comparison group. As is well known, D&B owns a large proprietary database that maintains records of more than 265 million companies with 30,000 global data sources, which is updated frequently. As part of the evaluation, SPR acquired data from D&B for a random sample of the companies that were funded by ETP during the 2017-2018 program year (n=1,000), and a comparison pool of 3,000 companies that were not funded by ETP during the 2017-2018 program year. For each company, we obtained data on company-level outcomes (company size and yearly sales) and company-level characteristics such as industry code, geographic location, and the year of funding for

[37] Osterman, *Improving Job Quality: Policies Aimed at the Demand Side of the Low-Wage Labor Market*; Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?*

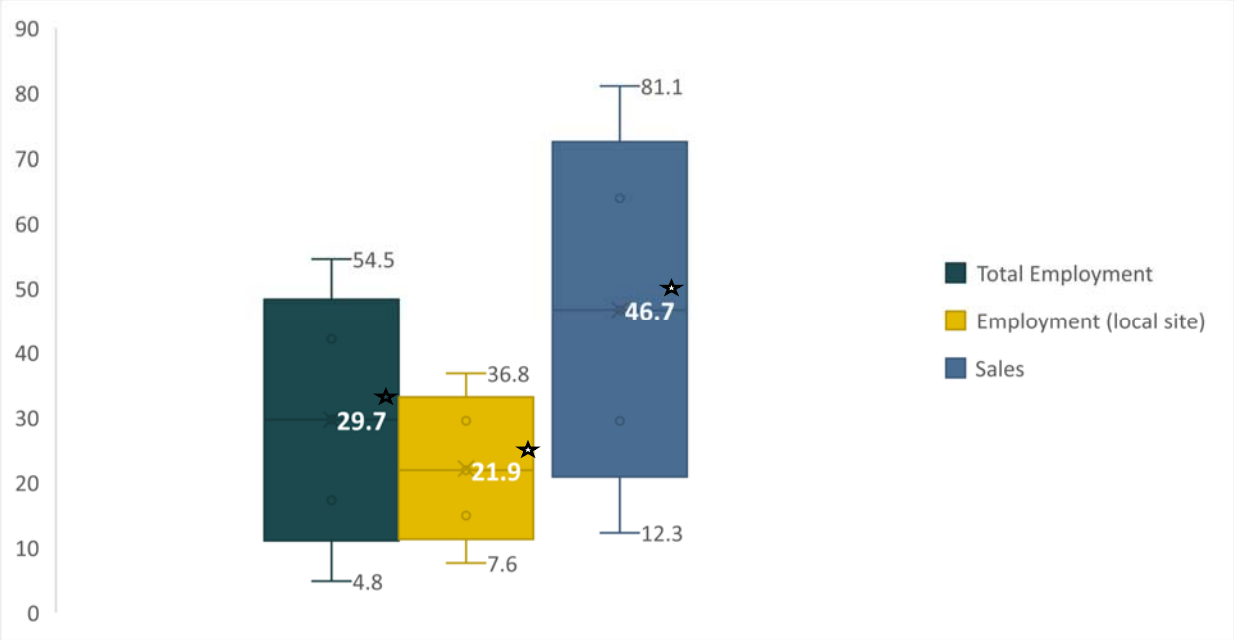
[38] Moore et al., *Training That Works: Lessons from California's Employment Training Panel Program*; Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?*

[39] Hollenbeck, *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?*

several years before participation (2013, 2014, and 2015) and at two years after participation (2019). More details about the methods we used to estimate impacts are provided in Appendix D.

Figure 9 summarizes the results of the impact analysis of ETP funding. We report both impact estimates (shown in the middle of each bar) and 95 percent confidence intervals (which represent the range within which the "true" impact estimates are predicted to lie with 95 percent certainty) shown as whiskers at the end of each bar.

Figure 9: Estimates of ETP Impact on Number of Employees (Firm Size) and Sales



Source: Dun & Bradstreet (2019)

Notes: * denotes statistical significance at the 95% level.

The results indicated that ETP-funded companies had, on average, more employees than a matched sample of comparison companies that were not funded by ETP (which approximate what would have happened in the absence of ETP funding). Specifically, ETP companies had on average 22 percent more employees at the funding site two years after receiving ETP training funds, a result that was statistically significant. Given the variability of the impact estimate, however, the impact of ETP might be expected to vary between eight and 37 percent, as shown by the 95% percent confidence interval. In addition, our analysis indicated that ETP-funded companies had 30 percent more employees overall, although there was more variation in this outcome, making the estimate less precise. These findings appear to confirm previous impact findings from an earlier study[40] and more generally insights from the literature that incumbent worker training programs have the potential to help firms by helping create new jobs or saving jobs from being eliminated.

As shown in Figure 9, ETP also appeared to have an overall positive effect on company sales (47 percent), with the true impact estimated to vary between 12 and 81 percent. This finding suggests that ETP funding may have improved labor productivity and competitiveness, leading to an increase in revenue.

[40] Moore et al. (2004) estimated the impact of ETP on employment at approximately 15 percent. However, their methodology was different from the one used in this study and therefore the estimates are not directly comparable.

The overall impact estimates therefore provide compelling evidence that state investments in incumbent worker training benefit both firms and workers in terms of increased jobs and revenue.

Does the Impact of ETP Vary for Different Types of Companies?

To provide additional insights into how ETP impacts companies and workers, the research team also analyzed impacts for certain types of companies. This section examines the impacts of ETP by company size, the age of the company, and industrial sector.

Impacts of ETP Funding by Company Size

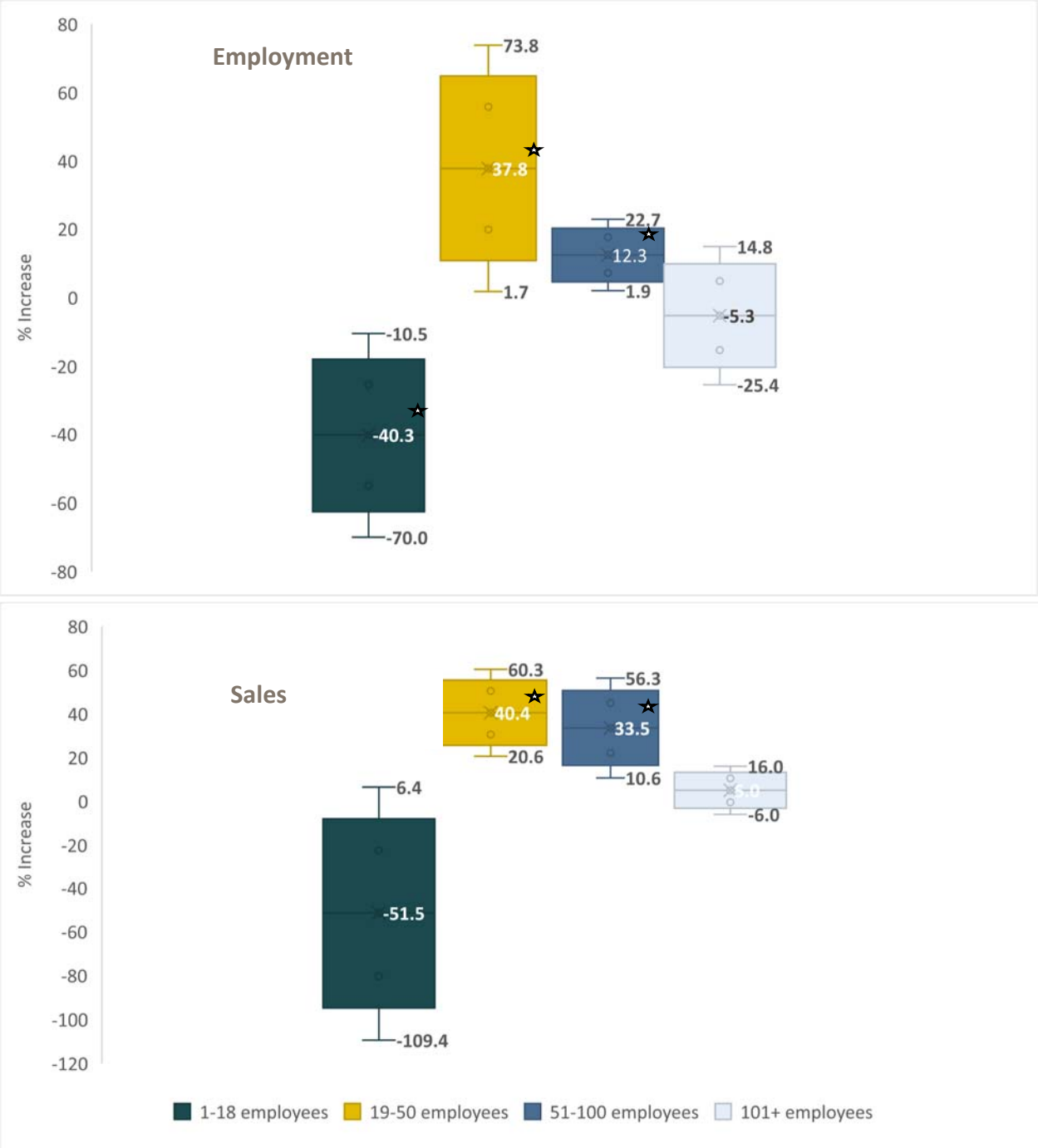
To control for year-to-year fluctuations, we calculated for each company its average size recorded in 2013, 2014, and 2015. We divided the sample into four subgroups of roughly equal proportion[41] based on this average size and conducted an impact analysis for each subgroup.

The results are displayed in Figure 10 and show distinct patterns for each group.[42] For all size categories except one, the calculated impacts on total employment and sales were positive. The companies from the category with the smallest employment (1-18 employees) appeared to fare relatively worse off compared to what would be expected had they not participated in the program, leading to negative impact estimates for employment (albeit the finding on the impact on sales was inconclusive). By contrast, companies in the next size bracket (19-50 employees) appeared to experience large and positive impacts on both outcomes, with each hovering around 40 percent. The positive impacts persisted for the next larger size category (51-100 employees), although they decreased in size compared to the previous bracket. Finally, the impacts for the largest category were small and not statistically significant.

[41] We chose four groups as opposed to a lower or higher number because this strategy yielded the highest number of groups with a sample size that was large enough to analyze.

[42] We use different groupings for those used earlier in this report because the earlier groupings would have resulted in unbalanced groups in terms of size.

Figure 10: ETP Impacts by Company Size



Source: Dun & Bradstreet (2019)

Notes: ** denotes statistical significance at the 95% level.*

These results suggest that ETP participation was strongly beneficial to small and medium companies (between 19 and 100 employees), which saw significant estimated boosts in employment and sales—an encouraging result given that almost half of all ETP companies with non-missing employment data were in that range. This finding is consistent with insights from qualitative interviews, which also suggested that

ETP participation tended to have a particularly strong organizational effect on small and mid-sized companies as it frequently caused them to boost their internal training systems.

Although somewhat puzzling, the finding that program participation did not appear to benefit very small companies (almost a quarter of the ETP companies with non-missing employment data) could indicate that for very small employers, the organizational changes required by ETP participation may create significant instability, at least in the short run (i.e., within two years). Alternatively, the pay-for-performance structure that forces employers to invest in training upfront and then wait for reimbursement may also create instability for very small firms. In the case of large employers, the availability of sizable internal resources that are used for training makes it less likely for ETP funding to have a clearly separate effect. This is also consistent with what we heard from employers that we interviewed, who tended to report that it was difficult to say what effect ETP had on their company because it was difficult to isolate the effects of ETP funding from the effects of other training activities and workforce investments they were making. A survey of ETP-funded companies conducted in 2019 also found that large employers were much more likely to say they provided training to their employees than small employers were.[43]

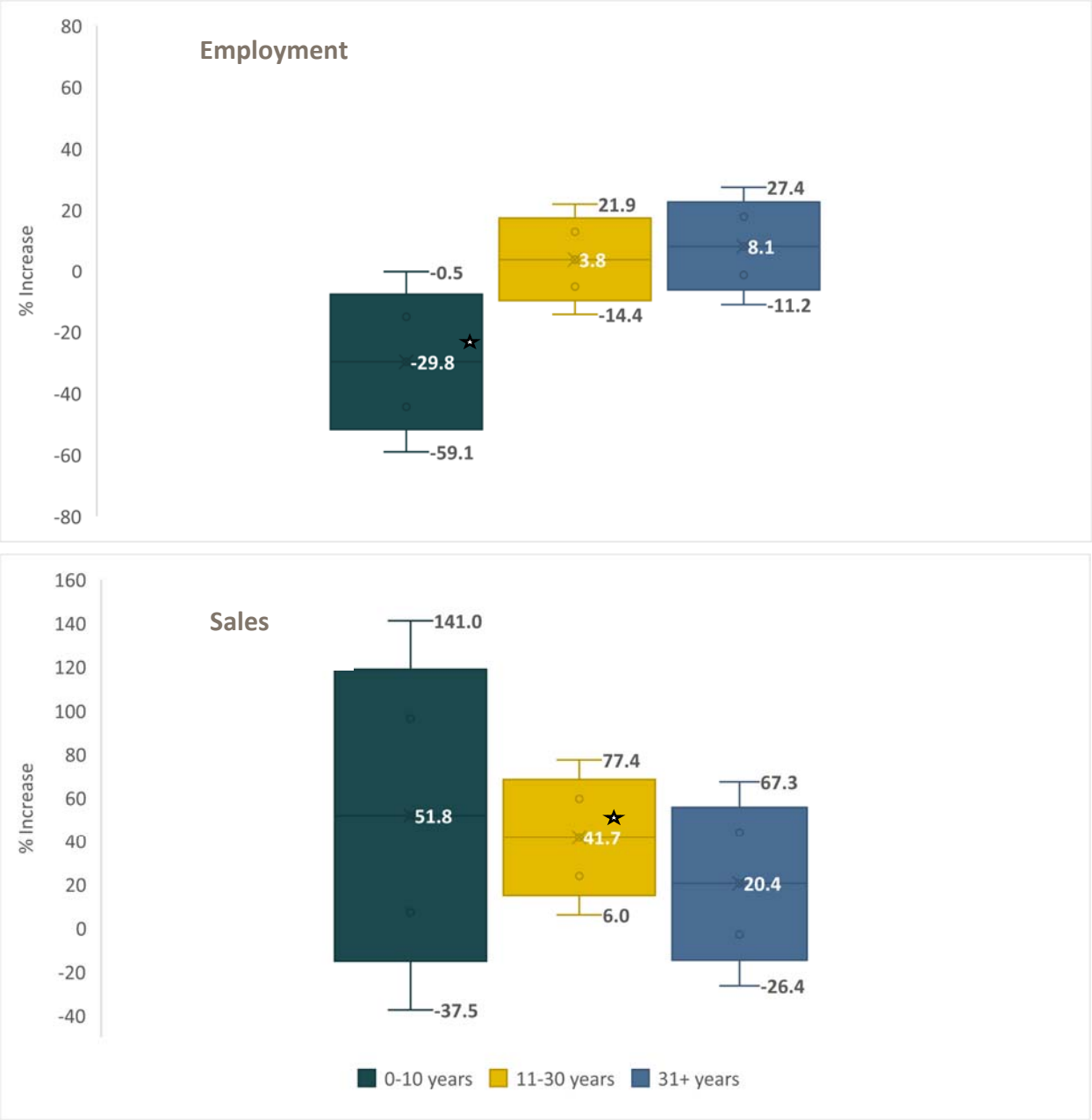
Impacts of ETP by Age of the Company

Another relevant dimension of variation for companies is their age—the number of years they have been in operation. An argument can be made that young companies (which include startups and companies that were founded recently) may have a considerable need for training, and a willingness to explore new areas, which might lead to a positive impact of training. However, young companies may not yet have defined priorities for training or established training systems, which may cause them to not invest optimally in training and therefore not benefit from it. More established companies would be more likely to possess adequate training systems, so they might be able to utilize the training to a larger extent. However, it is possible that these kinds of firms may have less of a need to access training given the availability of internal resources for training, which may lead to an insignificant impact of ETP training. We divided companies into three groups: young (0-10 years since establishment, as measured in 2017); relatively well established (between 11-30 years of age) and well-established (31 years or older).

The findings from the impact analysis by company age are shown in Figure 11. Most of the impact estimates were not statistically significant and were therefore inconclusive. However, ETP participation appeared to be associated with a statistically significant decrease in employment for young companies, which appears to support the view that insufficiently developed training systems make young companies less likely to reap the benefits of training. Although only 16 percent of the companies served by ETP fell in this category, this finding suggests that young companies may be faced with similar circumstances that very small companies experience (in fact, the average size of young companies was much lower than that of older companies). Together with small companies, therefore, young companies may represent an important area for additional research that might illuminate the specific needs of these groups and might suggest additional strategies and policies that ETP can enact to boost the impact of training for these companies.

[43] González, Negoita, Folsom, and DeFever, *Survey Issue Brief: California Employer Training Needs.*

Figure 11: ETP Impacts by Company Age



Source: Dun & Bradstreet (2019)

*Notes: * denotes statistical significance at the 95% level.*

Participating in the program appeared to be associated with a significant boost in sales for relatively well-established companies (between 11 and 30 years of age). This finding reinforced the sense that ETP participation may be especially impactful for companies that fall in a "sweet spot"—both from the perspective of size and age. This category appears to include companies that are mature enough to have developed a training infrastructure, but which also may significantly underinvest in training. As in the case of size, further research may illuminate the processes that are involved in accessing training as companies age and may provide a more complete picture.

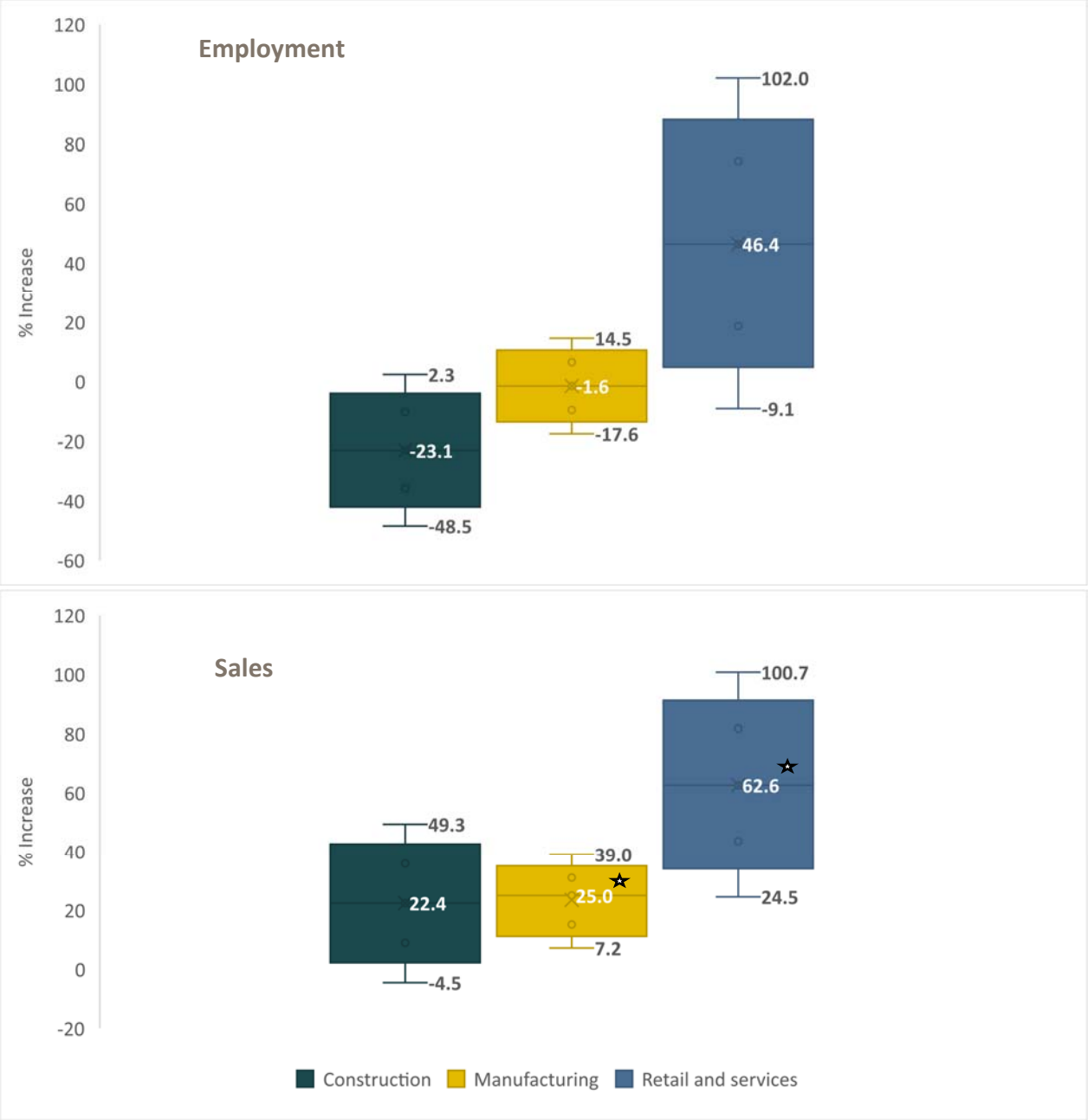
Impacts of ETP by Industrial Sector

Lastly, we examined impacts by industrial sector using Standard Industry Classification (SIC) codes. There is evidence that firms from some industrial sectors, particularly construction, tend to underinvest in training.[44] Given the relatively small size of the sample, we opted for inclusive classification categories ("divisions" in SIC parlance). Even with this strategy, not all major industrial groups had sufficient sample size for analysis. As a result, the only industrial classifications that could be adequately analyzed were construction, manufacturing, and retail and services (combined).

Our analysis (shown in Figure 12) did not find any statistically significant impacts of ETP funding on employment growth by industry. It appeared, however, that ETP's impact on sales for all types of companies was positive, although only the estimates for manufacturing and retail/services companies were statistically significant. Overall, therefore, there is encouraging evidence that ETP has a positive effect on sales for companies from manufacturing and retail/services sectors, whereas the evidence on employment was inconclusive.

[44] Frazis, Herz, & Corrigan, *Employer-Provided Training: Results from a New Survey.*

Figure 12: ETP Impacts by Industrial Sector



Source: Dun & Bradstreet (2019)

*Notes: * denotes statistical significance at the 95% level.*

Summary of Findings and Limitations

Overall, we found that ETP funding had a positive and significant impact on both employment and sales for participating firms, both overall and for some subgroups. A positive impact on employment appeared particularly pronounced for small and medium companies, whereas the impact on sales was notable for small and medium companies, relatively well-established companies (in terms of age), and manufacturing and retail/services companies.

The impact analysis presented in this section has several limitations. First, although the comparison pool of companies received from D&B was three times as large as the treatment sample, which in theory should be sufficient to ensure high-quality matches, there were large initial imbalances between the two groups in terms of baseline average employment and sales (the ETP group had much higher average numbers of employees and sales).[45] As a result, achieving covariate balance, especially for small subgroups, proved challenging. Although all analyses presented in this section ultimately achieved good covariate balance (the ability to match treatment and comparison groups very closely on pre-intervention characteristics), this was sometimes accomplished by removing outliers (typically, ETP companies with very large values) from the analysis. Appendix D provides additional details about covariate matching and balancing procedures. Subsequent research that utilizes larger samples of both ETP and comparison companies might be able to offer a more precise estimation.

Another particularity of D&B data is that certain data fields (especially important outcomes such as employment and sales) are given as either actual (measured) or estimated using D&B's own proprietary methods. Using imputed data increases the possibility of measurement error. Subsequent studies that try to replicate these findings using a different source of data (for example, employer information from state Unemployment Insurance records or data submitted for tax purposes) would provide additional confirmation for these findings.

In addition, it is possible that some of the companies both in the treatment and the comparison pool received ETP funding in the past (i.e., before 2017). If that was the case for a sufficiently high number of companies, this could result in imprecise measurement of the impact of ETP participation. If companies from the ETP sample had received assistance from ETP prior to 2017, some of the effect that ETP might have had could have already taken place in the past; therefore, the impact estimated for 2017 for these companies might be smaller than its actual impact accrued over a number of years. Correspondingly, if a comparison company had received assistance from ETP in the past, and benefitted from it, the difference in outcomes between it and a matched ETP-funded company would be smaller than if the comparison company had never received support; this, then, would tend to depress the size of impacts as well.

Lastly, we were only able to analyze the impacts of ETP funding on two specific outcomes—firm size and sales—as D&B data do not include other important potential company-level outcomes such as labor turnover, innovation outcomes, and profitability. Examining these other outcomes would be an important next step for ETP.

Overall, although these analyses are limited, they clearly suggest a strong potential impact of ETP funding, particularly for certain types of firms, and suggest potentially important policy changes for ETP. We discuss these implications in the next section.

9. Conclusions and recommendations

When ETP was created in the 1980s, the driving concern was solidifying California's competitiveness in a globalizing world through enhanced workforce skills that would keep employers and jobs rooted in the state. Recently, the focus has shifted towards responding to dramatic technological changes and their effects on the nature and quantity of work. At the same time, companies are contending with a large wave of retiring workers and a need to cultivate new leadership. In this final section, we summarize the assessment's key findings related to how ETP is meeting the current needs of companies and workers in California, including the benefits of ETP participation, how ETP can promote continuous improvement, and

[45] More details are offered in Appendix D.

how it can be updated to align with current and future training needs and delivery methods. We conclude with a series of recommendations for ETP to consider.

Benefits of ETP participation

ETP is the predominant source of government support for incumbent worker training in California. Employers and labor organizations reported that they were generally happy with ETP programs and appeared to benefit from participation in many ways: motivating and retaining workers, keeping up to date with technology, staying competitive, and enhancing internal capacity for training. Although more research is needed, small and mid-sized companies reported greater effects from ETP funding on their internal organizations (e.g., training capacity, career ladders, development of training curriculum) and ability to expand. Employers stated that they valued being able to choose training providers. They also felt that ETP could bring greater value to their organization and other employers in California if the administrative processes were more user friendly and if more employers were aware of the program.

ETP program outcomes and impacts

Overall, companies were more likely to train a higher share of their workforce if they were small, had higher labor turnover, and were in manufacturing, construction, or healthcare. Thus, ETP-funded training may play a larger role in shaping training in these types of firms.

We also found that spending more per approved trainee led to a higher likelihood that a company would train the workers it planned to train, which suggests that the higher the dosage of training proposed, the more likely a company is to fulfill its training goals. Consequently, proposing more intensive (vs. light-touch) training may be an early indicator of a company's ability to succeed in training all the workers it plans to train. Other indicators of a company's likelihood of carrying out all its planned training included participation in a MEC, being a small or mid-sized company, and having low levels of labor turnover.

The quasi-experimental impact study we conducted showed that ETP-funded companies fared better compared to similar companies that did not benefit from ETP support, suggesting that the program does have a positive impact on the companies it serves.

Findings on ETP programs, structure, and administrative processes

ETP appeared to be diversifying the pool of employers that it served through participation in special initiatives and greater use of MECs to partner with community colleges, industry associations, and other workforce partners as intermediaries. These partnerships and special initiatives, such as the one with the California Energy Commission, allowed ETP to target skills upgrades in specific sectors and enhance support for innovative models of training. Increased coordination with intermediaries also appeared to support overall workforce system innovation and generate promising practices and models of training, such as regional training centers that offer community college courses on-site with employers or in an industrial park.[46]

However, ETP was still disproportionately supporting large firms relative to the distribution of firms by size in California. This was concerning because key informants and users tended to report that ETP funds had a greater effect on small and mid-sized employers' operations, organizations, and training capacities (although they also reported that those firms had greater need for guidance and technical assistance to successfully access ETP funds). One likely reason why ETP was not serving more small and mid-sized

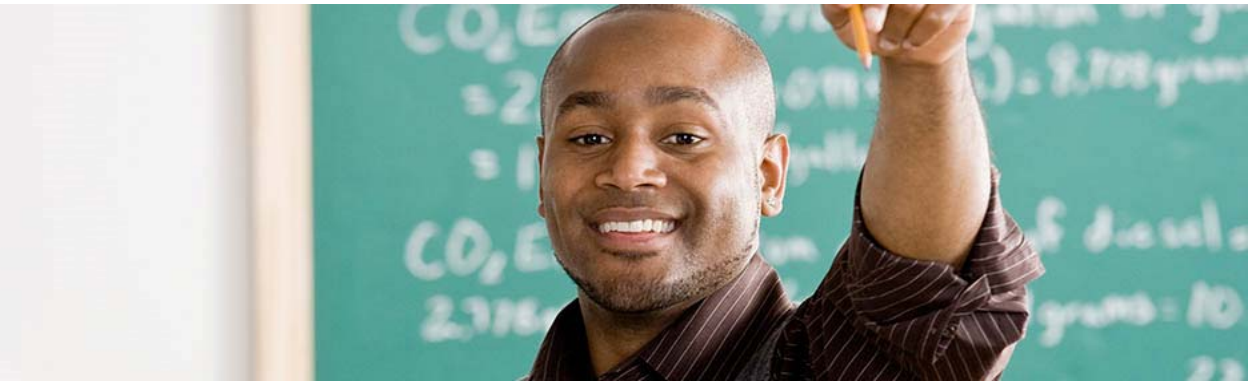
[46] The InTech Center in San Bernardino is an example of a regional training center (see the textbox on page 22 and the California Forward website: http://cafwd.org/reporting/entry/training-center-built-by-colleges-and-manufactures-to-close-inland-empire-s).

employers was due to its pay-for-performance funding structure. Female trainees also appeared to be underserved by ETP, most likely due to gender imbalances in the industries of the employers that currently participate in ETP and due to ETP's focus on the private sector (rather than the public sector).

Further, although intermediaries and users appreciated recent improvements in ETP's operations and administrative processes, they still found them too time consuming, not user friendly, and set-up primarily for single-employer users rather than MECs. They also found ETP's rules to be outdated, confusing, and overly focused on compliance.

Some employers said they were supportive of ETP expanding nontraditional apprenticeships, but others felt they were too burdensome to develop. Larger companies tended to be more supportive of apprenticeships and appeared to have more capacity to invest the time needed for their development and implementation. Employers who said they were motivated to increase apprenticeships shared recommendations for how ETP could support them.

Adapting ETP to current training needs and methods



Employers and labor organizations reported expanding their use of online learning and technology and anticipated providing more of their training via these delivery modes in the future (though they also still placed a high value on classroom training). Large companies were more likely to report using a highly advanced LMS that incorporates self-driven training modules with artificial intelligence; small and mid-sized companies tended to state that they used ETP to establish an LMS when they previously did not have a formal system.

Many users said they did not utilize ETP for online or on-the-job training, but mainly for on-site, classroom-based training. The main reasons that they shared for not utilizing ETP for these modes of training were a lack of awareness, difficulty of fulfilling reporting requirements, and low reimbursement rates. Informants suggested that ETP regulations and reimbursement rates should distinguish between self-directed online learning and interactive, instructor-led online learning because they felt that the latter (but not the former) was similar in quality to in-person classroom training. Regarding on-the-job training, informants also expressed a need for ETP to revisit the limits and reporting requirements as evidence grows that on-the-job training, work-based learning, apprenticeship, and contextualized learning are promising practices for teaching mid-level applied technical skills that are in high demand.[47] Informants said it would be more appropriate for ETP to track competency-based measures than training hours for on-the-job training and online learning.

[47] U.S. Department of Labor, U.S. Department of Commerce, U.S. Department of Education, and U.S. Department of Health and Human Services, *What Works in Job Training: A Synthesis of the Evidence*.

The stated use of industry-recognized credentials among ETP users varied considerably and appeared to be highly influenced by the level of regulation in the sector or occupation. Healthcare, food manufacturing, aerospace, and pharmaceuticals, for example, valued credentials more because they helped reduce regulatory risk and improve quality. Informants in other sectors felt their work was too customized to justify using any credentials other than the most basic, such as OSHA.

Recommendations

This section includes a series of recommendations for updating and enhancing the ETP program and administrative processes based on the findings above. While adopting some of these recommendations may require legislative changes, others can be adopted through a revamping of ETP regulations and/or the redesign of administrative processes and information systems. The recommendations include the following:

- Increase outreach efforts to small and mid-sized firms and draw on the current findings to meet their needs for more guidance and capacity building. ETP can continue to focus on increasing the use of MECs and bringing in new partners to serve as intermediaries that already have relationships with small and mid-sized firms – especially from priority sectors that are not well represented among ETP participating companies. As ETP serves more small and mid-sized employers, we recommend additional in-depth interviews with these employers to gather information about how ETP can better meet their needs to formalize training programs and internal career ladders, identify quality training providers, develop curricula, and implement ETP's reporting requirements.
- Update ETP regulations and Unemployment Insurance statute. Reviewing and updating the regulations and statute will help support ETP staff in their efforts to streamline processes, align the program with current employer needs and training delivery methods, communicate the rules effectively to employers, and implement some of the recommendations included in this report (as appropriate). It will also provide an opportunity to update key terms, such as "productive lab," to terms that are widely used today (for that example, "on-the-job training").
- Target industry sectors with a higher representation of female trainees to begin to address the gender imbalance. Priority sectors such as healthcare are more likely to have a higher share of female workers. ETP can also consider an employer's demonstrated efforts to diversify the gender of their workforce in male-dominated industries as a factor in deciding which applications to approve or which employers to approve for repeat contracts.
- Incorporate feedback from a wide range of user types—MEC users, single-employer contract users, large firms, small firms—as ETP develops new information systems. Given that we observed substantial differences in terms of how employers of different sizes and on different contract types tended to use and access the program, ETP can develop user profiles for small, mid-sized, large, single-employer, and MECs when designing the new information system to have users of different types provide feedback. It may also be helpful to develop the new system with feedback from users that have a range of experience and familiarity with ETP; such as users that are accessing the process for the first time, experienced users, and expert-users (consultants). Consolidating access to the information systems into one website or portal in the new system would make it easier for new intermediaries, users and organizations working with multiple employers to interact with the system.

- Establish the new information systems in a way that facilitates easier tracking of program outcomes and impacts through real-time dashboards and that integrates well with commonly used LMS and human resources information technology platforms. With the development of the new information systems, ETP has an opportunity to facilitate more robust evaluation of outcomes and impacts and to integrate automatically with existing platforms. Some specific recommendations include:
    - Tracking and reporting annual expenditures (in addition to reporting contract-level expenditures and the annual amount approved) to convey a clear sense of how the actual size of the program changes year-after-year.
    - Developing a combined indicator to measure how much was approved but not spent each year (a combination of disencumbered and terminated funding amounts), which could help ETP identify the common reasons why companies do not complete the training that they initially planned in future evaluations.
    - Collecting information about each company's key point of contact for training, in addition to the key contact for invoicing. This would facilitate identifying the right contact for survey administration. Ideally, this information would be collected as a requirement when applying for ETP programs.
    - Creating tags in the administrative data system to identify types of training that can be used to compare outcomes and impacts. Examples include tags for apprenticeships, contract structure (MEC, single-employer, etc.), and special initiatives.
- Consider offering more flexibility for using ETP to support management and supervisory training and updating training delivery categories to adequately reflect the current state of educational technologies, business processes, and digital training methods. Given current demographic trends in the workforce (with upcoming retirements) and trends in the rapid diffusion of new digital technologies, ETP can align its rules and policies to make it easier for employers to access new forms of training on processes or technologies that employers are adopting. As older workers retire and companies automate production, they are more likely to train their workers in management and problem-solving skills than before. In addition, employers may seek to train workers using mobile applications or augmented reality, which is not easy to categorize into existing training delivery categories such as "computer-based training," "productive lab," or "classroom" training. ETP's rules and compliance procedures should also account for the substantial differences between different forms of digital training, such as interactive online training (distance learning), blended learning, self-paced training, and digital literacy training.
- Consider establishing a separate set of rules, administrative processes, and funding structures for companies of different sizes to further diversify the pool of users and to better align ETP's program structure with the training needs of employers that are in a stage of rapid growth. We found that large companies had different training needs compared to small and mid-sized companies, and that small and mid-sized companies tended to report greater impacts of ETP on their company overall. While the pay-for-performance structure appeared to be working well for large companies, the risk involved limited the ability of small and mid-sized firms to access ETP or to benefit from participation, as shown by the negative impacts calculated for these companies in the impact study. Partnerships and MECs helped, but intermediaries and companies struggled with the risk of making upfront investments in training without knowing if they would be reimbursed or without the ability to wait for reimbursement given their own resource limitations or funding restrictions. Taken together, these findings seem to justify having one set of rules and program structures suitable for large companies and another for small and mid-sized companies.

- ETP can consider other ways to prioritize support for small or mid-sized companies that are in a stage of growth and expansion for training support. The high-growth stages of a company's lifecycle are likely to be a stage in which the company creates more jobs, has high training and retention needs, and has a greater need to implement training-related infrastructure. Currently, small and mid-sized companies seem to report more training needs and more benefits from ETP participation, but they are under-represented in ETP programs. ETP and/or legislators may consider alternative ways (other than the pay-for-performance structure) to ensure that ETP is supporting small and mid-sized companies that create high quality, high-wage jobs. For instance, ETP could offer more support for management training and technical assistance related to establishing internal career ladders, learning management systems, and formalizing internal training programs or apprenticeships. ETP should also continue to expand the use of MECs, because they appear to make the program more accessible to small and mid-sized employers.
- Position ETP as a statewide entry point for employers to access the services available through the broader public workforce system and as a resource for information about quality training. Employers and intermediaries who worked with many employers throughout the state expressed that employers found the public workforce system very confusing to navigate, and that it was difficult to tell what resources were available. Moreover, employers widely reported a lack of unbiased data on training provider quality and a lack of awareness about local training assets.[48] Interviews with small and mid-sized companies suggest that employers might even be willing to pay for more assistance from ETP in dealing with these challenges and in trying to establish a more sophisticated system for continuous learning in their company. Although they reported relying on industry associations to some extent, these companies communicated a need for more detailed guidance on government services and unbiased information about providers.
- Make it easier for users to access online and on-the-job training but consider assessing compliance for those methods through competency-based measures rather than hours completed. Users reported low usage of ETP to reimburse online learning and on-the-job training, even though they used these methods regularly and planned to use them even more in the future. Barriers included lack of awareness that these methods were eligible for reimbursement, unfavorable reimbursement rates, and seemingly arbitrary limits on the number of hours allowable. Moreover, informants felt the most appropriate way to measure effectiveness of these methods was through competency rather than hours.
- Conduct an analysis of ETP's impact on trainees at the individual level. Because tens of thousands of workers are served by the program each year, we strongly recommend that ETP consider commissioning the design and implementation of a quasi-experimental study of individual-level impacts of ETP on trainees.

The findings in this assessment should be considered preliminary due to data limitations. They should also be interpreted within the context of the vibrant economy with low unemployment. To strengthen the generalizability of the findings presented above and to provide ETP with additional information to improve program operations, we recommend that ETP consider conducting additional research on the following topics:

- Trainee perceptions of the value of workplace training funded through ETP and different training delivery methods;

[48] Several states and workforce organizations are collaborating to address data transparency gaps in training provider markets through projects such as the Training Provider Outcomes Toolkit. See Peterson, "Choosing a Training Provider Should be as Easy as Buying a Car."

- Differences between how small and large companies use and benefit from ETP to increase the reliability and generalizability of findings; and
- Promising practices of partnerships (e.g., community college programs to target training in alternative fuel technology) and innovative models of training (e.g., nontraditional apprenticeship, regional training centers).

Another key recommendation for ETP to consider—particularly during the process of updating its information systems—is to collect additional administrative data to enable it to more easily conduct rigorous analyses of the program's impact. As discussed above, this would include capturing both pre- and post-measures of program success at the company and trainee level. It would also involve identifying a better source of comparison data to assess program impacts. Appendix A has more detail on these recommendations.

Overall, this assessment entailed an initial investigation into how employers use and benefit from ETP, as well as how ETP can update and enhance the program to keep pace with changes in technology, the economy, and the workforce. The recommendations above were developed with the intent of helping ETP meet its full potential to achieve the mission of the legislation by providing effective support and training options to employers and workers in California. With upcoming changes to the information system, ETP has a rare opportunity to not only make the administrative process more automated and user-friendly, but also to enhance capacity to conduct future research that can be used to inform decisions about the program and the administrative processes. Further research and data enhancements would increase the reliability and generalizability of the findings reported here and will offer more rich and reliable estimates of the program's impacts. As a next step, ETP plans to administer the employer survey instrument developed as part of this assessment in the near future, which will provide data from a larger sample of users to supplement the findings in this report.

Appendix A: Quantitative Data Processing and Methodology

Outcomes study

For the purposes of conducting the outcomes study, SPR used administrative data transmitted by ETP. These data included companies that started an ETP contract in 2014 or 2015 and closed the contract in 2015 or 2016, along with information about these contracts. ETP's administrative data extract contained two datasets: an employer-level dataset and a contractor-level dataset. SPR combined these two datasets using a unique contract identifier provided in both. There were 2,173 employers assigned to 316 contracts.

SPR made the following coding decisions when creating variables for employer-level analysis:

- We created a "business size category" variable by splitting number of employees per company into three categories: "small" (1–50 employees), "mid-sized" (51–250) and "large" (251 or more)
- We created a "high turnover" dichotomous variable by recoding the company turnover variable into two categories: "not high" (lower than 10 percent) and "high" (10 percent or more). This threshold was chosen due to the fact that the distribution was highly skewed to the right.
- We created a variable counting the total trainees per company by combining the per company counts of re-trainees or new hires (each company trained either incumbent employees or new hires, and never both).
- We created a dichotomous "new hire" variable indicating whether a company was operating under a new hire or a re-trainee contract.
- We created a variable measuring the total amount of funding received by combining per company re-trainee and new hire funding.
- We created two ratio outcome variables: percentage of trainees out of total number of employees, and funding per trainee.

We made the following coding decisions when creating variables for contractor-level analysis:

- We created an "average business size per contractor" variable by calculating a simple average of the number of employees in all companies under a given contract.
- We created a "contractor size category" by splitting the above variable into the same three categories that we used for describing employer size.
- We created an "average turnover per contractor" variable by calculating a simple average of turnover in all companies under a given contract.
- We created a "high contractor turnover" dichotomous variable according to the same rules used in employer-level analysis.
- We created a categorical variable indicating the quartile of approved spending per approved contractor.

To estimate the (company-level) proportion of trainees among the total number of employees of the company, we used a fractional outcome regression model with the following independent variables: an indicator of whether a company was part of a single-employer or MEC contract (with MEC contract being the reference category), company size category (where "large" was the reference category), type of industry (provided by ETP), an indicator of high turnover (low turnover was the reference category), an indicator of a "new hire" type of contract (i.e., the reference category was a "re-trainee" contract type), and an indicator of a "core" type of contract (contracts were "core" or "alternative," indicator provided by

ETP, and "core" was treated as reference category). Observations with proportion of trainees higher than 1.0 were removed from sample as most likely resulting from data entry errors; those observations constituted 2 percent of the sample. A fractional outcome model is an application of probit and logit maximum likelihood techniques to cases where the dependent variable is a fraction, proportion, or rate.[49]

Note: A "reference category" is a value of a categorical variable to which the regression coefficient on that variable is being related. For instance, given that in the case of the variable "core or alternative contract" the reference category is "core," a coefficient of (-.21) next to that variable tells us that, all else equal, an alternative contract has an average of 21 percent fewer trainees among employees *as compared to a core contract*.

To estimate the (contract-level) percentage of trainees who were placed compared to the initial number of individuals approved to train, we have estimated a generalized linear model with the following independent variables: contractor-level size category, quartile in terms of amount of spending per approved trainee (reference category: first quartile), an indicator of high turnover, an indicator of a "new hire" type of contract, and an indicator of a "core" type of contract. With respect to comparable variables, reference categories were the same as in the employer-level model.

The outcomes study consistently uses *regression-adjusted means* when reporting subgroup statistics. That is, group means are computed as mean predicted values of the outcome of interest while holding other variables constant. This ensures that the reported between-group differences in means are related to group membership rather than to other characteristics that may correlate with it.

Suggestions for improving data quality

Below we offer suggestions for dealing with the limitations in ETP's administrative described above to enable successful impact analyses of ETP outcomes in the future. Our suggestions for changes to ETP administrative data include:

- Require companies that are approved for training to provide data on outcomes of interest (e.g., company size, labor turnover rate, revenue, productivity, efficiency, average trainee earnings) both at time of participation and after the 90-day performance period ends as a condition for reimbursement. This would enable analysts to have more precise measures of pre–post differences that could be used in both outcomes and impact studies.
- For companies with multiple locations, specify the exact sites/plants/branches where individuals are trained. This would make it easier to describe the geographic distribution of where ETP funds go and to establish a comparison group for impact assessment.
- Collect common identifiers for each participating company location for widely used data sources (if not already collected), such as the employer's state or federal tax ID number. This would make it easier to uniquely identify specific sites/locations within companies.
- Conduct a data quality review of individual-level (trainee) data, such as the accuracy of characteristics such as veterans' status. Having a better understanding of the quality of individual-level data can inform decisions about which alternative study designs or questions are feasible.
- Explore alternative sources of data that have the desired data elements for treatment and comparison companies and that are measured at regular time intervals. For example, ETP could potentially obtain such a dataset through a special requisition. Alternatively, ETP could explore

[49] Papke and Wooldridge, "Econometric Methods for Fractional Response Variables with an Application to 401(K) Plan Participation Rates."

public datasets such as tax records. Availability of data by time period would ensure high-quality baseline and follow-up data for both ETP and non-ETP companies.

Additional recommendations for enhancing ETP's administrative data systems

- Request data from the state tax agency to collect more precise financial outcomes information at the company level (e.g., sales, revenue).
- Collect more detailed information about characteristics of the training received by participants, such as the content, delivery method, duration, competencies achieved, and quality. This would allow for more comprehensive analysis of how ETP impacts the lives of individual workers.
- Track the training provider, training provider type (e.g., private vendor, community college, etc.), skills or competencies targeted in the training, and training occupation.
- Track type of training (e.g., classroom training, online training, apprenticeship).
- Ensure that individual-level data are linked to company-level data in the new system.
- Consider tracking race and ethnicity data in the same way that the U.S. Census does (separate Hispanic from race categories) in order to more easily compare the trainees to the population.
- Develop dashboards with key indicators of program usage in the new system to track progress towards program goals in real time. For example, ETP could set a goal to address the gender imbalance in trainees and monitor the gender breakdown as contracts are approved each month.

Appendix B: Employer Survey Instrument Design

The survey instrument included in this report is designed to gather employer feedback on key dimensions of ETP's program. The primary goal of the survey is to identify areas of strength and areas of improvement in various aspects of ETP's program including the application and award processes, ETP's web-based contracting systems, current and future needs for employee training options, and partnerships to enhance employee trainings. Ultimately, survey findings will inform ETP's operational improvement strategies to enhance participants' experience with the program. Ideally, this survey would be implemented every 2-3 years to provide information about how these aspects change over time.

Survey development

SPR used a number of sources and methods to inform the development of the initial draft of the questionnaire. To ensure key survey themes were reflected in the survey, SPR worked collaboratively with ETP staff and used feedback from the key informant interviews from ETP staff and partners. SPR also referred to previously tested employer survey questionnaires to develop some of the questions measuring opinions about employees' skills. Once the initial draft of the questionnaire was completed, ETP staff reviewed and provided comments. SPR revised the draft questionnaire accordingly and then conducted six cognitive interviews with employers and MEC contractors. The objective of the cognitive interviews was to ensure the questions and terms included were clear and applicable to their experiences. See Appendix C, for a final draft of the survey, which incorporates feedback from the cognitive interviews.

Because ETP's administrative data already collects some company demographics such as industry sector, the survey instrument will not re-collect that information. The final draft of the survey questionnaire gauges participant opinions on the following themes:

- Levels of difficulty in navigating ETP's application and award processes
- Levels of satisfaction with ETP's application and award processes
- Levels of satisfaction with ETP's online systems
- Importance of current and future types of employee trainings
- Current and future content of employee trainings needs
- Opinions and value given to certifications and apprenticeships
- Importance of various skills, certifications, and degrees for the future workforce
- Levels of engagement with other partners and intermediaries
- Communication preferences with partners and intermediaries

Target population, sampling strategy, and sampling frame

As described earlier in this report, ETP's program serves a mix of small, mid-sized, and large companies under two types of contracts: multiple-employer contracts (MECs) and single-employer contracts. The target population for the survey would be composed of all the companies that have an active ETP contract at the time of the survey, those companies that completed their contracts within the prior year, as well as those companies that applied or received a contract but did not complete it. Based on 2015-16 data, there were 2,550 companies in the contract cycle with 265 employers using single-employer contracts, and 2,285 companies that were part of 53 separate MECs. In addition, approximately 200 companies received a

contract but did not complete training as planned and roughly 400 additional companies completed their contract within the prior year. Thus, the maximum sample size for the survey is approximately 3,150.

Because surveying 3,150 contacts may not be feasible, ETP could consider selecting a sample from their target population. There are several considerations necessary for this step, but sampling typically starts by selecting cases from the target population at random. In addition to the method of selection, there are two overarching considerations in selecting the size of one's sample. The first is the overall sample size necessary to generate precise estimates for the full sample. The second is whether there are distinct subgroups that are important to include, such as employers using single-employer contracts. If so, then a sufficient number must be selected for each subgroup to ensure precise estimates can be generated to allow results to be generalized to the broader population. ETP might also want to consider excluding companies that operate under MECs but are only lightly involved with ETP activities (e.g. receive very little funds from ETP or train only a handful of employees), it could be fruitful to determine which of them have enough information to contribute for the survey ahead of time.

Should ETP opt to select a sample, rather than survey the entire population, ETP will need to generate the sampling frame, which identifies all companies and the contact information (e.g. name, phone number, and email) of a person within each of the companies that are part of the target population. Ideally, the sampling frame should include key characteristics of the companies ETP serves so that there is sufficient information to implement the sampling strategy and ensure that there are no survey items asking for information that is already captured. Some of these characteristics may include companies' number of employees, their ETP field office and their primary contact in the ETP field office if available, their industry sector, the contract type (core and alternative), an indication of whether they are a first time ETP contractor or a repeat contractor, the amount of the award for the current active contract, the number of approved trainees, and whether the contract was awarded to serve special populations (e.g., ex-offenders, at-risk youth, or veterans). We also recommend adding the number of trainees who completed training hours and amount reimbursed for training if these are available.

For surveys conducted within organizations in which there may be multiple potential respondents to the survey, it is critical to reach the person who is most knowledgeable about the survey themes and is best equipped to provide meaningful answers. Contact information that is currently in ETP's data base may not necessarily be the best person to respond to the survey, because these contacts may include those who manage the companies' invoices and not those who are closer to the provision of employee training. For this reason, SPR strongly recommends either: (a) ETP conducts internal data checks to ensure that there is a fitting contact field for the purposes of the survey; or (b) using a screening phone call to identify those who would be the most knowledgeable to respond to the survey. Because this represents additional time spent in phone calls, it will likely increase the cost of survey administration, but it is necessary to take one of these steps in order to get higher response rates, to obtain more accurate and valid data, and to reduce the burden on the employers responding to the survey.

Survey strategy and response rates

There are various strategies to deploy the survey. One of them would be to allow employers to complete the survey over the phone directly after a phone screener if the interviewer reaches the right person within the company. If the interviewer reaches a person that is not the right informant, then he/she would try to collect the contact information for a new contact who would be able to provide better information for the survey. After this, there could be one or two attempts to allow the new contact to respond to the survey over the phone or deploy the survey online.

In lieu of a screener, another strategy could be to leverage ETP's field staff knowledge of the companies they work with. One of the roles they could assume is to help collect the contact information of those people within the companies who are closer to the provision of employee trainings. The benefits of involving ETP's field staff early in the survey process would be two-fold. First, they are likely the best equipped to determine who the best informants for the survey are. Second, because they have a relationship with contacts within each company, their involvement is likely to encourage survey participation and boost response rates.

Over the last decade, researchers have observed declining responses rates for surveys, including employer surveys.[50] Low response rates—lower than 40%—threaten the representativeness of survey results and the generalizability of its findings. For this reason, SPR recommends bolstering the response rate in a variety of ways. First, as mentioned earlier, we recommend having the phone and online options open to respondents. Mixed mode surveys are increasingly popular because they have shown great potential to boost response rates and increase coverage by correcting for survey mode biases (e.g. correct for lack of access to computers).[51] At least three attempts should be made to reach respondents to complete the survey over the phone and online. Although adding telephone follow-up attempts increases the cost of implementing the survey, these tend to increase the external validity (the representativeness) of the survey by increasing response rates.

The second strategy to boost response rates is to keep the survey very brief (no more than 15 minutes) and keep the survey in the field for a period of at least six weeks. Research shows that longer surveys tend to have lower response rates and that longer periods of time on the field may help increasing response.[52]

A third recommendation would be to use multiple outlets to inform employers about the survey (e.g. newsletters, conferences, their website, though their ETP office representatives, etc.). This could include examining the possibility of adding a link to the survey in the formal correspondence companies already receive from ETP (e.g. electronic invoices). Staff in the ETP offices, who serve as companies' main points of contact, could start this communication. To support them, they should be provided with uniform documents explaining the aims of the study and addressing frequently asked questions including:

- How does participation benefit my company?
- How much time is involved?
- How long is the survey?
- What kind of questions does the survey ask?
- Benchmark or informative resource as an incentive?
- Will my information be disclosed?
- How this information is valuable for ETP to better serve employers?

In addition, a method to raise the probability of response is to provide an incentive to those who complete the survey. In conversations with ETP, two types of incentives were explored: providing a summary of survey findings that would be of interest to the whole pool of employers and providing a guide of available funding sources to continue strengthening their own employee training program. Respondents should be informed about the incentive during the introduction to the survey.

[50] Kohut et al., "Assessing the Representativeness of Public Opinion Surveys."
[51] Vannieuwenhuyze, Loosveldt, and Molenberghs, "A Method for Evaluating Mode Effects in Mixed-Mode Surveys."
[52] Rolstad, Adler, and Rydén, "Response Burden and Questionnaire Length"; Holbrook, Krosnick, and Pfent, "The Causes and Consequences of Response Rates in Surveys by the News Media and Government Contractor Survey Research Firms."

After survey data is collected, SPR recommends examining non-response bias and designing statistical weights to minimize it. Nonresponse occurs when not all sample members respond to a survey. This becomes more problematic if there is the potential for nonresponse bias, which occurs when respondents with certain characteristics respond in greater (or lesser) percentages than others. For example, if a much higher percentage of single employers respond to the survey, then any results obtained from the survey may be attributable to the differential response rates (and the resulting statistical imprecision), rather than to any real difference between single employers and those in MECs. In general, the ability to make inferences to any group is contingent on having a sufficient number of responses (and, therefore, a reasonably high response rate) from members of that group. To estimate the extent of potential non-response bias, SPR suggests comparing observable characteristics of the survey respondents to the characteristics of all eligible survey contacts. Should differences be statistically significant, there is need to design appropriate weights to minimize bias. Methods of designing survey weights should be well documented in the final survey report.

Appendix C: Employer Survey Instrument

Introduction

The California Employment Training Panel thanks you for participating in this survey! We appreciate you helping us identify areas of strength and areas for improvement in various aspects of ETP's program. We are interested in learning about your experiences with the application and award processes and about your current and future needs for employee trainings. Ultimately, we intend to use what we learn from this survey to provide you with better services. Participation in this survey is voluntary and, should you decide to participate, you will receive a link to a document containing information about additional funding opportunities that could help you strengthen your employee training programs. We hope you can take advantage of this resource.

Q Intro A. May we continue with the questions?

- o Yes [GO TO Q1]
- o No

Q Intro B. Is there a better time we can call you?

- o Yes [RECORD preferred time and thank respondent for their time]

Employer characteristics

These first few questions ask about you and your company's background.

Q1. Just to verify, what is the name of your company or organization?

Q2. What is the status of your contract with ETP? *Select all that apply.*

- o I currently have an active ETP contract
- o I completed an ETP contract in the past year
- o I do NOT have an active contract [TBD; additional questions for these companies]

Q3. From the statements below, please select the one that best describes your role in your most recent ETP contract:

- o I managed most aspects of contract administration myself (e.g., applying, reporting).
- o My company hired an outside consultant to manage most aspects contract administration OR someone else in my company managed most aspects of contract administration [SKIP TO Q5]
- o I administered a multiple employer contract (MEC) for ETP on behalf of several companies

Q4. How many years of experience do you personally have with the management of ETP's contracts?

- o Less than one year
- o 1 to 2 years
- o 2 years or more

Q5. What is your role at your company or organization? *Select all that apply.*

- o Human resources
- o Manager/supervisor of employees
- o Training Supervisor/Manager/Director
- o CFO/CCO
- o CEO/President/Owner
- o Other: [ ]

Q6. How long have you been employed at your current company or organization?

- o Less than one year
- o 1 to 2 years
- o 2 years or more

Q7. How often have you or someone in your company been in touch with ETP staff over the last year?

- o Multiple times per month
- o About once a month
- o 4 to 6 times a year
- o 1 to 3 times a year
- o Was not in touch with ETP staff directly last year

ETP's award process

The next few questions ask about your experiences at the time of applying for and obtaining ETP funds.

Q8. How did you first learn about ETP? *Select all that apply.*

- o ETP staff
- o Another employer
- o Internet or social media
- o Article/news story
- o State agency (e.g. EDD, California Energy Commission)
- o Local economic development agency or representative
- o Local workforce development board or representative
- o Industry association (e.g., CMTC, CMTA, CWA)
- o Training provider or community college
- o Union or labor federation
- o Consultant specializing in ETP
- o Other: [ ]

Q9. Who helped you navigate the ETP's application process? *Select all that apply.*

- o A consultant hired by your company [HIDE IF Q3=3]
- o ETP's staff from a regional field office
- o Person(s) from an industry association (e.g., CMTC, CMTA, CWA)
- o Person(s) from a state agency (e.g. EDD, California Energy Commission)
- o Person(s) from a local economic development agency
- o Person(s) from a workforce development board or representative
- o Person(s) from a training provider or community college
- o Union or labor federation
- o Other: ☐

Q10. Thinking about ETP's application and award processes, how easy was it for you to navigate the following– very easy, easy, about the right level of difficulty, difficult, very difficult?

		Very easy	Easy	Difficult	Very difficult	Don't know
PRE-AWARD	Eligibility requirements	o	o	o	o	o
	Pre-application process	o	o	o	o	o
	Proposal process	o	o	o	o	o
	Panel meeting	o	o	o	o	o
	Understanding the reporting rules associated with computer based training (CBT) or productive lab training	o	o	o	o	o
	Communication with ETP staff during the process of receiving award	o	o	o	o	o
POST-AWARD	Communication with ETP staff after receiving award	o	o	o	o	o
	Reporting requirements using the Legacy system	o	o	o	o	o
	Reporting requirements using the ETMS system	o	o	o	o	o
	Technical assistance from ETP staff to resolve pending issues (e.g. contract modification)	o	o	o	o	o

Q11. Thinking about ETP's application process, how satisfied are you with the following aspects—not at all satisfied, somewhat satisfied, very satisfied, extremely satisfied?

	Not at all satisfied	Somewhat satisfied	Very satisfied	Extremely satisfied	Don't know
Information available to learn about ETP's program	o	o	o	o	o
ETP's webinar	o	o	o	o	o
Information on ETP's website that is applicable to your company	o	o	o	o	o
Support from ETP staff with interpreting how eligibility rules apply to your company	o	o	o	o	o
Support with ETP contract from a third-party consultant	o	o	o	o	o
Responsiveness of ETP staff to complete the application process	o	o	o	o	o
Overall length of time it took to go through the application process	o	o	o	o	o

Q12. After receiving ETP's award(s), how satisfied are you with the following— not at all satisfied, somewhat satisfied, very satisfied, extremely satisfied?

	Not at all satisfied	Somewhat satisfied	Very satisfied	Extremely satisfied	Don't know
ETP's support with the interpretation of reporting requirements	o	o	o	o	o
ETP timeliness in communicating compliance issues	o	o	o	o	o
ETP's support in addressing compliance issues	o	o	o	o	o

The administrative process for reimbursement	o	o	o	o	o
Requirements for reimbursement	o	o	o	o	o
Timeliness of reimbursement	o	o	o	o	o

ETP's online systems

As you may know ETP's online systems are in transition; the following questions are about your satisfaction with the systems that are currently in place.

Q13. [SKIP IF Q3=2] Do you have experience with any of following web-based contracting systems from ETP?

- o Online forms/Tracking, **Legacy**
- o Employment Training Management System, **ETMS** [SKIP to Q15]
- o Both

Q14. [SKIP IF Q3=2] How satisfied are you with the following aspects of ETP's **Legacy** system of online forms and tracking—not at all satisfied, somewhat satisfied, very satisfied, extremely satisfied?

		Not at all satisfied	Somewhat satisfied	Very satisfied	Extremely satisfied	N/A
LEGACY	The Legacy system overall	o	o	o	o	o
	The Legacy system's data upload/input capabilities	o	o	o	o	o
	The Legacy system's data download/extraction capabilities	o	o	o	o	o
	The Legacy system's navigation and ease of use	o	o	o	o	o
	The technical support for the Legacy system	o	o	o	o	o

Q15. [SKIP IF Q3=2] How satisfied are you with the following aspects of the **ETMS**—not at all satisfied, somewhat satisfied, very satisfied, extremely satisfied?

		Not at all satisfied	Somewhat satisfied	Very satisfied	Extremely satisfied	N/A
ETMS	ETMS system overall	o	o	o	o	o
	ETMS system's data upload/input capabilities	o	o	o	o	o
	ETMS system's data download/extraction capabilities	o	o	o	o	o
	ETMS system's navigation and ease of use	o	o	o	o	o
	Technical support for the ETMS system	o	o	o	o	o

Q16a. [SKIP IF Q3=2] Please briefly describe features you may want to see in a new version of ETP's system.

Q16b. [SKIP IF Q3=2] How can ETP improve its systems to better suit your needs?

Training services

The next section is about types and content of trainings as well as modes of delivery.

Q17. [SKIP IF Q3=3] We are interested in the trainings your company currently provides and the types of training your company plans to provide in the next three years. *Select all that apply*:

	Currently provide	Planning to provide in the next 3 years	Have not considered providing	Not sure
Work-based training: registered apprenticeships	o	o	o	o
Work-based training: paid internships	o	o	o	o
Work-based training: productive labs	o	o	o	o
Work-based training: on-the-job training	o	o	o	o
On-site instructor-led training in a classroom	o	o	o	o
Off-site instructor-led training in a classroom (e.g. community college)	o	o	o	o
Instructor-led online/virtual training (distance learning)	o	o	o	o
Self-driven online training, not instructor led	o	o	o	o
Mixed instructor-led/work-based training	o	o	o	o
Other:	o	o	o	o

Q18. [SKIP IF Q3=3] How important is it to offer the following types of training to your workforce?

	Not at all important	Slightly important	Fairly important	Important	Very important	N/A
Work-based training: registered apprenticeships	○	○	○	○	○	○
Work-based training: paid internships	○	○	○	○	○	○
Work-based training: productive labs	○	○	○	○	○	○
Work-based training: on-the-job training	○	○	○	○	○	○
On-site instructor-led training in a classroom	○	○	○	○	○	○
Off-site instructor-led training in a classroom (e.g. community college)	○	○	○	○	○	○
Self-driven online training, not instructor led	○	○	○	○	○	○
Instructor-led online/virtual training (distance learning)	○	○	○	○	○	○
Mixed instructor-led/work-based training	○	○	○	○	○	○
Other:		○	○	○	○	○

Q19. [SKIP IF Q3=3] What is the current content of the trainings you offer to employees and what content do you plan to offer 3 years from now?

	Currently offer	Planning to offer three years from now	Not planning to offer	Not sure
Soft skills (e.g. communication, dependability, motivation, team work, etc.)	o	o	o	o
General skills (e.g. applied math, reading comprehension, written communication, problem solving)				
Basic computer skills (e.g., office software)	o	o	o	o
Specialized technical skills (e.g. machine operation, specialized software)	o	o	o	o
Lean manufacturing	o	o	o	o
Training aligned with an industry recognized credentials or digital badges	o	o	o	o
Managerial/ supervisory skills (e.g. project management, leadership)	o	o	o	o
Specialized professional-level training (e.g. training for engineers)	o	o	o	o
Other:	o	o	o	o

Q20. From your perspective, which type of employee trainings would you say are most in demand today? *List up to three examples.*

Q21. What certifications do you consider most valuable for employees to have today? *List up to three.*

Q22a. [SKIP IF Q3=3] Does your company have an apprenticeship program?

- o Yes
- o No [SKIP to Q24]
- o Not sure [SKIP to Q24]

Q22b. [SKIP IF Q3=1 OR IF Q3=2] Does the multiple employer contract that you operated most recently include any form of apprenticeship training?

- o Yes
- o No [SKIP to Q24]
- o Not sure [SKIP to Q24]

Q23a. Is this a registered apprenticeship program?

- o Yes, it is registered
- o No, it is not registered [SKIP TO Q24]
- o Not sure [SKIP TO Q24]

Q23b. Is your apprenticeship program registered by the following agencies?

- o Only by the CA Division of Apprenticeship Standards (DAS)
- o Only by the Federal Department of Labor (DOL)
- o Registered by both agencies
- o Not registered
- o Not sure

Q24. How familiar are you with the concept of a registered apprenticeship training program?

- o Not at all familiar
- o Slightly familiar
- o Somewhat familiar
- o Moderately familiar
- o Extremely familiar

Q25. In your opinion, how important are apprenticeship programs for enhancing a company's ability to train its workers?

- o Not at all important
- o Slightly important
- o Fairly important
- o Important
- o Very important
- o Not sure

Q26. [SKIP IF Q3=3] Thinking about the future workforce your company will need, how important is it that the future employees you hire demonstrate proficiency in the following skill and knowledge areas?

	Not at all important	Somewhat important	Important	Very important	N/A
Effective oral communication	o	o	o	o	o
Working with others in teams	o	o	o	o	o
Written communication	o	o	o	o	o
Ethical judgment and decision-making	o	o	o	o	o
Team leadership	o	o	o	o	o
Critical thinking and analytical reasoning	o	o	o	o	o
Problem solving and analysis	o	o	o	o	o
Locating, organizing, and evaluating information from multiple sources	o	o	o	o	o
Innovation and creativity	o	o	o	o	o
Basic computer literacy and proficiency in general office software	o	o	o	o	o
Staying current on changing technologies and their applications to the workplace	o	o	o	o	o
Working with numbers and understanding statistics	o	o	o	o	o
Problem solving with people from different backgrounds and cultures	o	o	o	o	o
Proficiency in a language other than English	o	o	o	o	o

Q27. In your opinion, in the next 3 years, which skills and competencies will be the most important for your newly hired employees to have? *Please choose the three most important ones.*

Skills and Competencies	
Basic skills (good with numbers, good reading comprehension, and writing skills)	o
Computer skills	o
Sector specific skills	o
Specialized technical skills	o
Communication skills	o
Team-working skills	o
Analytical and problem-solving skills	o
Ability to adapt to and act in new situations	o
Planning and organizational skills	o
Other: ☐	o

Q28. How much do you agree or disagree with the following statement? "My company has an easy time hiring employees with the right level of skills to fill positions that become available"

- o Strongly agree
- o Agree
- o Neither agree nor disagree
- o Disagree
- o Strongly disagree
- o Don't know

The next set of questions ask about your opinions about the types of certifications and degrees employees at different levels of your organization should have. First,

Q29a. Thinking about **entry-level positions**, how important is it for employees to have the following …?

	Not at all important	**Somewhat important**	**Important**	**Very important**	**N/A**
Industry recognized credentials/certifications	o	o	o	o	o
A high school degree	o	o	o	o	o
An associate's degree	o	o	o	o	o
A bachelor's degree	o	o	o	o	o
A master's degree or higher	o	o	o	o	o

Q29b. Thinking about **mid-level positions**, how important is it for employees to have the following …?

	Not at all important	Somewhat important	Important	Very important	N/A
Industry recognized credentials/certifications	o	o	o	o	o
An associate's degree	o	o	o	o	o
A bachelor's degree	o	o	o	o	o
A master's degree or higher	o	o	o	o	o

Q29c. Thinking about **supervisory/managerial positions**, how important is it for employees to have the following…?

	Not at all important	Somewhat important	Important	Very important	N/A
Industry recognized credentials/certifications	o	o	o	o	o
An associate's degree	o	o	o	o	o
A bachelor's degree	o	o	o	o	o
A master's degree or higher	o	o	o	o	o

Q30. Regarding your employee training needs, is there anything that ETP could provide or do differently that would enhance your experience with the program?

Engagement with other partners

Q31. During the past year, how often have you been in contact with the following partners to obtain advice about your employee training needs?

	Never	Rarely	Occasionally	Frequently	Very frequently	N/A
Regional Economic Councils	o	o	o	o	o	o
Employment Training Panel Staff	o	o	o	o	o	o
California Community Colleges Chancellor' Office	o	o	o	o	o	o
Employment Development Department	o	o	o	o	o	o
Division of Apprenticeship Standards	o	o	o	o	o	o
Local workforce development board	o	o	o	o	o	o
American Job Centers	o	o	o	o	o	o
Joint Apprenticeship Committees	o	o	o	o	o	o
Staffing/Temp agencies	o	o	o	o	o	o
Industry association	o	o	o	o	o	o
Chamber of commerce	o	o	o	o	o	o
Local economic development agencies	o	o	o	o	o	o
Local community colleges	o	o	o	o	o	o
For-profit training providers	o	o	o	o	o	o

Q32. Does your company have a labor management partnership? [PROBE: A labor management partnership is a new strategic model for labor unions and management to work together]

- o Yes [GO TO Q32a]
- o No [SKIP TO Q33]
- o Don't know [SKIP TO Q33]

Q32a. In what ways does your company benefit from this labor management partnership?

Perceptions about the value of ETP involvement

Q33. Some employers have mentioned deriving some benefits from their involvement with ETP. In your case, how much do you agree with following statements? Has your involvement with ETP helped you and your company…

	Strongly disagree	Disagree	Agree	Strongly agree	Don't know
Learn about new employee training options	O	O	O	O	O
Expand training opportunities to more employees	O	O	O	O	O
Increase the quality of existing trainings	O	O	O	O	O
Improve employee morale due to additional training offerings	O	O	O	O	O
Retain employees	O	O	O	O	O
Strengthen internal pathways for employee advancement	O	O	O	O	O
Create opportunities to hire more new workers	O	O	O	O	O
Create opportunities to formalize internal HR systems	O	O	O	O	O
Improve your company's ability to compete globally	O	O	O	O	O
Increase your company's ability to adopt new technologies (e.g. tools, machinery)	O	O	O	O	O
Increase focus on strategic business planning	O	O	O	O	O
Increase overall productivity	O	O	O	O	O
Increase overall efficiency	O	O	O	O	O
Increase revenue and profit growth	O	O	O	O	O

Q34. Are there other ways that ETP help your company accomplish your employee training goals?

Communication preferences with different partners

Q35. Thinking about different partners you may be engaged with; how often would you say you communicate with them?

	Less than I would like	Just about right	More than I would like
Regional Economic Council	o	o	o
Employment Training Panel Staff	o	o	o
California Community Colleges Chancellor' Office	o	o	o
Employment Development Department	o	o	o
Division of Apprenticeship Standards	o	o	o
Local workforce development board	o	o	o
American Job Centers	o	o	o
Joint Apprenticeship Committees	o	o	o
Industry association	o	o	o
Chamber of commerce	o	o	o
Local economic development agency	o	o	o
Local community colleges	o	o	o
For-profit training providers	o	o	o

Q36. What are your preferred modes of communication with partners? *Select your top <u>three</u> preferences.*

- o Online newsletters and bulletins
- o Email
- o Phone calls
- o Text messages
- o Conferences or forums
- o Conference calls
- o LinkedIn
- o Twitter
- o Facebook
- o Other: ☐

Thanks for completing the survey! Please enter your email address below so we can send you a document with funding opportunities that could help you strengthen your training program for employees.

☐

Appendix D. Matching Tables

This appendix accompanies Section 8. Its main roles are to describe the data used in the impact analysis and to present detailed tables that describe the quality of the matching procedures that were developed for each analysis.

We used propensity score matching to estimate the impacts of ETP funding. In propensity score matching, one or more comparison group companies are selected to match each treatment group company based on a set of matching variables. For this analysis, we used the following matching variables:

- Age of the company (measured as the number of years passed since the company's founding until 2017)
- Pre-participation size (an average of the number of employees for the three available pre-participation years-2013, 2014, and 2015)
- Industry group (using two-digit SIC classification codes). To ensure balanced groups, three SIC Divisions—Agriculture, Forestry, and Fishing; Mining; Transportation, Communications, Electric, Gas, And Sanitary Services; and Finance, Insurance, And Real Estate-were grouped together and labeled as "Other".
- Region of the state where the company was located. We used the California Economic Markets (Coastal, Eastern Sierra, Northern, Sacramento, San Francisco Bay Area, San Joaquin Valley, Southern, and Southern Border) developed by the California Employment Development Department (https://www.labormarketinfo.edd.ca.gov/geography/regional-economic-profiles.html). To ensure balanced groups, the Northern region was added to the Sacramento region and the Coastal region was added to the San Francisco Bay Area region.
- For select models, we also used a matching variable that measured whether employment was trending upward or downward during the pre-intervention years (2013-2015), which improved covariate balance for those models.

D&B data measures employment in two ways: number of employees at the site being funded by ETP (in the case a company has several sites, or branches); and the total number of employees. We computed an impact estimate for each of these outcomes, as well as for yearly sales. All impact estimates are obtained as differences in regression-adjusted outcomes between the treatment and the matched comparison groups and are expressed in percentage points increase:

$$\frac{t-c}{c} * 100,$$

where t represents the regression-adjusted treatment group mean and c represents the matched comparison group regression-adjusted mean.

All the variables used in the analyses had a small amount of missing data. Cases with missing data in either the matching characteristics or the outcomes were dropped from the analyses.

In a quasi-experimental impact design based on propensity score matching, the quality of matching (i.e., the ability to match treatment and comparison groups very closely on pre-intervention characteristics, otherwise known as covariate balance) is crucial. For each of the analyses presented in Section 8, the remainder of this appendix presents tables that can be used to judge the matching quality. For each analysis, we tested many models; only the ones with the highest matching quality were included in the

report. In each of the following tables, we include the total number of observations (treatment and comparison, both before and after matching). We also include standardized mean differences and variance ratios for matching covariates, both before and after matching (well-balanced covariates should have a standardized mean difference that is close to zero and a variance ratio that is close to one). Finally, we show kernel density plots of propensity scores over treatment levels, both for the raw data and the matched sample produced. The closer the plots for the matched treatment and comparison groups are, the better the overall covariate balance.

In some cases, inverse probability weighting (IPW) was preferred to propensity score matching for estimating impacts. Rather than selecting a group of matched comparison cases for each treatment unit, IPW utilizes the entire comparison pool (i.e., it does not discard any comparison units from the analytic sample), but it weights the data such that comparison units that resemble the treatment units more receive a larger analytical weight. In the case of IPW, kernel density plots are not available. Instead, we list the results of an overidentification test that shows whether the covariates were successfully balanced (a test probability higher than 0.05 means that we cannot reject the null hypothesis that covariates were balanced).

As stated above, the remainder of the appendix presents covariate balance tables for all analyses included in the main report. Since the tables provide the same information, there is no need to comment each table separately. The main criteria that should be used to judge covariate balance are standardized mean differences, variance ratios, and balance plots/overidentification tests.

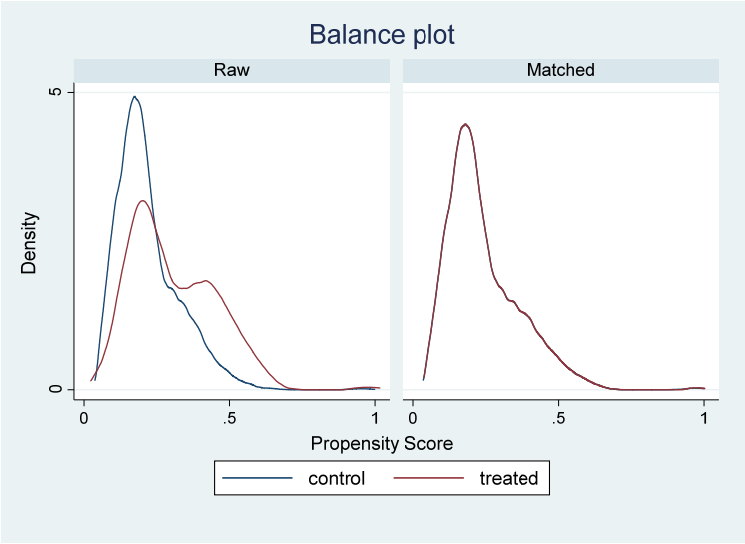
Covariate Balance: Overall

Total Employment

	Raw	Matched
Total number of observations	2,957	5,914
Treatment observations	713	2,957
Control observations	2,244	2,957

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.32	-0.05	1.21	0.91
Employment growth ("increase" is reference category)				
Steady	-0.08	-0.04	1.16	1.08
Decrease	0.04	0.02	1.09	1.05
Average pre-intervention employment	0.18	0.05	4.60	1.08
Industry (construction is reference category)				
Manufacturing	-0.11	0.06	0.91	1.05
Retail Trade	-0.34	-0.03	0.53	0.95
Services	-0.06	-0.02	0.91	0.97
Other	-0.01	0.03	0.98	1.14
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.05	-0.01	1.09	0.98
San Joaquin Valley	0.08	0.05	1.26	1.15
Southern	-0.08	-0.01	1.03	1.01
Southern Border	-0.07	-0.02	0.80	0.94
Outside California	0.02	-0.03	1.26	0.67

Notes: caliper matching; caliper = 0.06. Estimated using teffects psmatch in Stata 15.

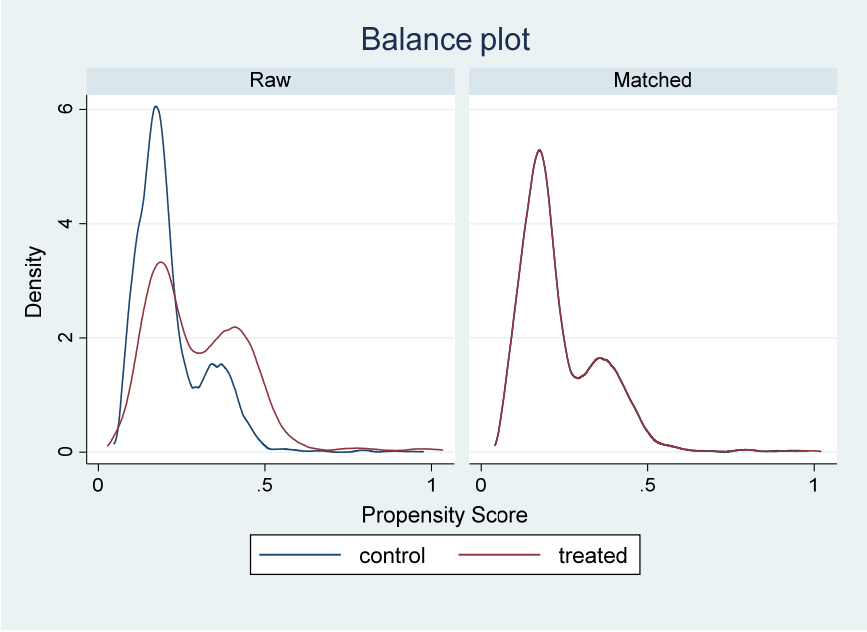


Employment-Local Site

	Raw	Matched
Total number of observations	3,161	6,322
Treatment observations	748	3,161
Control observations	2,413	3,161

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.25	-0.09	1.06	0.87
Average pre-intervention employment, local site	0.27	0.06	5.86	1.07
Industry (construction is reference category)				
Manufacturing	-0.11	0.03	0.91	1.02
Retail Trade	-0.34	-0.04	0.53	0.95
Services	-0.07	0.02	0.90	1.03
Other	0.03	0.02	1.13	1.07
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.05	-0.02	1.08	0.96
San Joaquin Valley	0.07	0.05	1.25	1.15
Southern	-0.06	-0.05	1.01	1.01
Southern Border	-0.07	-0.01	0.79	0.97
Outside California	-0.02	0.03	0.94	1.10

Notes: caliper matching; caliper = 0.1. Estimated using teffects psmatch in Stata 15.

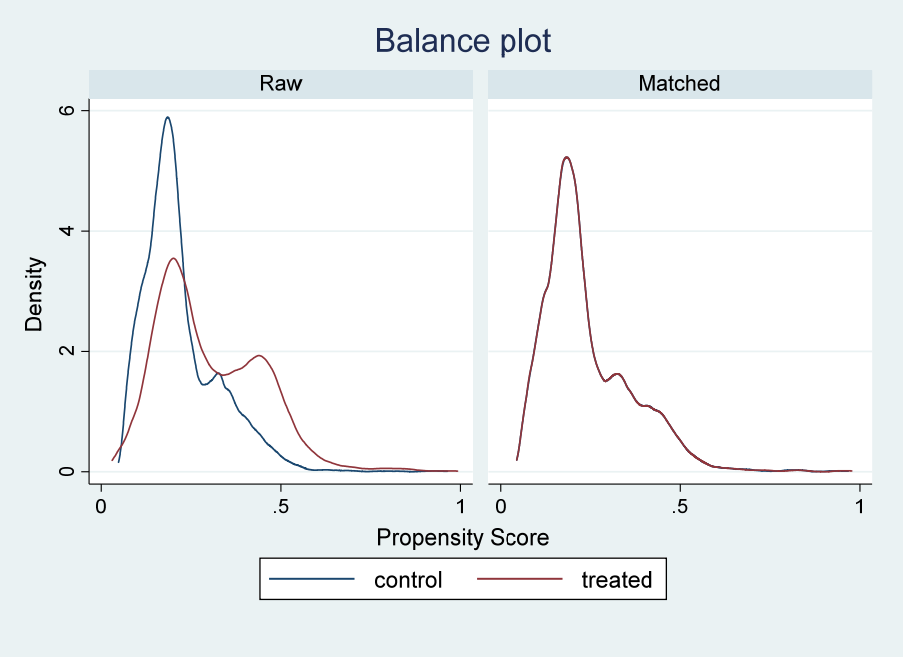


Sales

	Raw	Matched
Total number of observations	2,974	5,948
Treatment observations	713	2,974
Control observations	2,261	2,974

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.31	-0.04	1.19	0.94
Average pre-intervention sales	0.21	0.06	3.90	1.07
Industry (construction is reference category)				
Manufacturing	-0.11	-0.04	0.90	0.96
Retail Trade	-0.34	0.04	0.54	1.06
Services	-0.07	0.04	0.90	1.06
Other	0.00	-0.05	0.98	0.80
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.05	-0.07	1.08	0.89
San Joaquin Valley	0.07	0.08	1.24	1.24
Southern	-0.07	-0.01	1.03	1.00
Southern Border	-0.06	-0.05	0.81	0.86
Outside California	0.02	0.06	1.19	1.88

Notes: nearest neighbor matching, 2 nearest neighbors. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $2 billion) were removed from the sample. Estimated using teffects psmatch in Stata 15



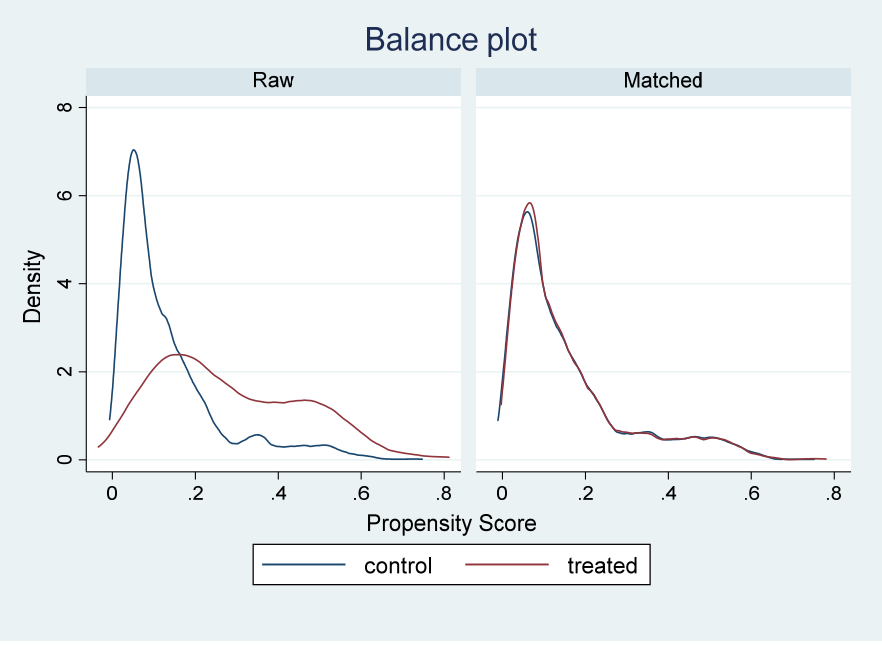
Covariate Balance-Subgroups by Size

0-18 employees-Total Employment

	Raw	Matched
Total number of observations	998	1,996
Treatment observations	156	998
Control observations	842	998

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	-0.27	-0.06	0.87	0.80
Average pre-intervention employment	-0.74	-0.01	1.26	1.21
Industry (construction is reference category)				
Manufacturing	-0.57	0.08	0.42	1.07
Retail Trade	-0.30	-0.01	0.62	0.99
Services	0.49	0.07	1.76	1.11
Other	-0.02	-0.07	0.87	0.67
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.11	-0.13	1.18	0.79
San Joaquin Valley	0.08	0.07	1.28	1.23
Southern	-0.15	0.17	1.06	0.90
Southern Border	-0.12	-0.19	0.64	0.42

Notes: Nearest neighbor matching, 10 nearest neighbors. Estimated using teffects psmatch in Stata 15.

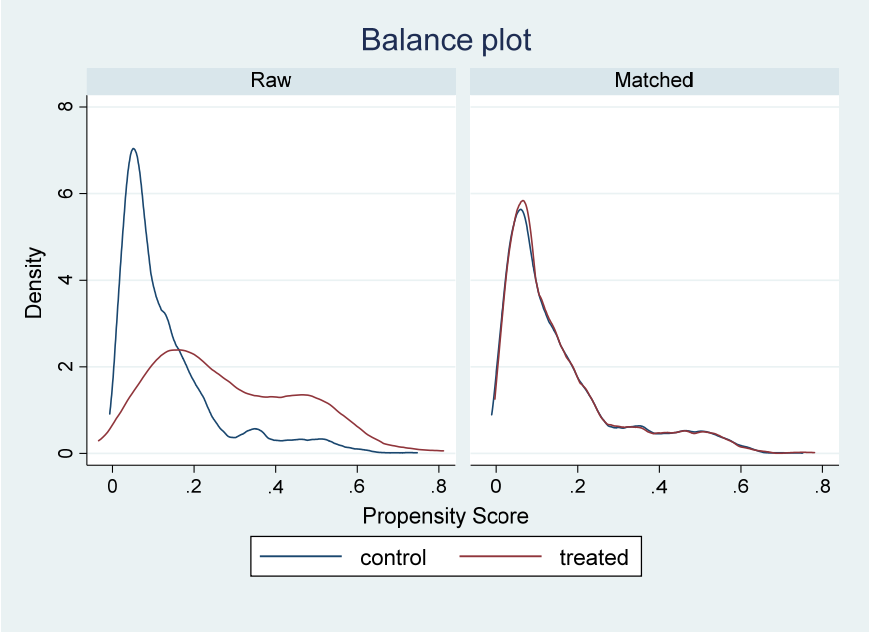


0-18 employees-Sales

	Raw	Matched
Total number of observations	931	1,862
Treatment observations	153	931
Control observations	778	931

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	-0.28	-0.08	0.88	0.76
Average pre-intervention sales	-0.69	0.01	0.66	1.11
Industry (construction is reference category)				
Manufacturing	-0.60	0.05	0.42	1.04
Retail Trade	-0.26	-0.01	0.65	0.98
Services	0.52	0.09	1.85	1.14
Other	-0.03	-0.05	0.86	0.73
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.09	-0.09	1.15	0.87
San Joaquin Valley	0.11	0.13	1.39	1.43
Southern	-0.15	0.04	1.06	0.98
Southern Border	-0.12	-0.18	0.64	0.46

Notes: Nearest neighbor matching, 10 nearest neighbors. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $5 million) were removed from the sample Estimated using teffects psmatch in Stata 15

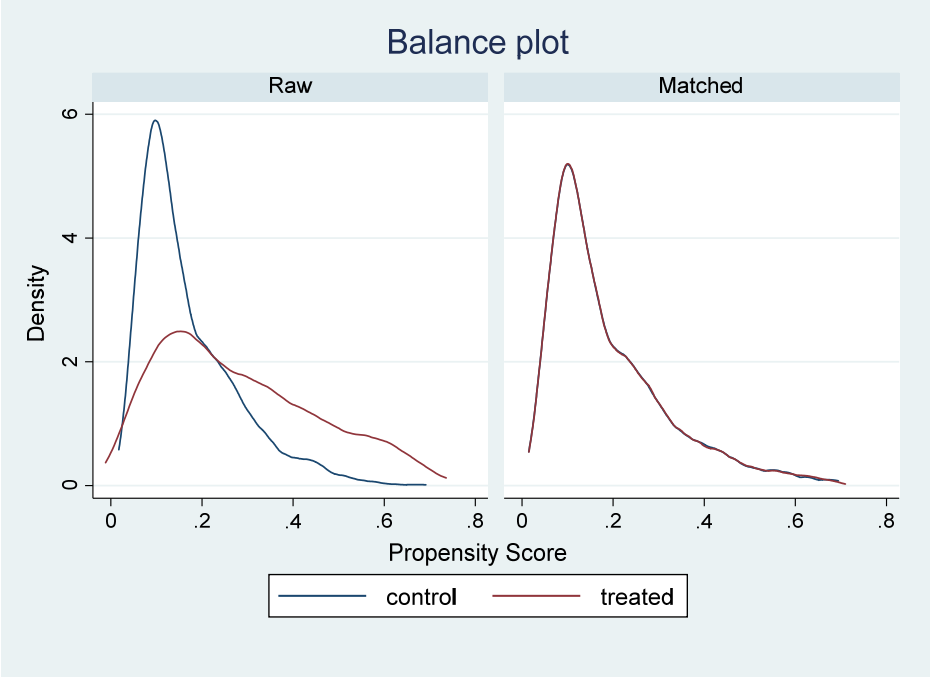


19-50 employees-Total Employment

	Raw	Matched
Total number of observations	1,056	2,112
Treatment observations	201	1,056
Control observations	855	1,056

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.28	-0.06	0.94	0.86
Average pre-intervention employment	0.36	0.02	1.27	1.02
Industry (construction is reference category)				
Manufacturing	-0.11	0.01	0.88	1.01
Retail Trade	-0.33	-0.02	0.56	0.97
Services	-0.26	0.02	0.66	1.02
Other	-0.05	-0.04	0.78	0.84
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.13	-0.02	1.22	0.97
San Joaquin Valley	0.07	0.12	1.22	1.34
Southern	-0.14	-0.05	1.04	1.01
Southern Border	-0.05	-0.02	0.86	0.93

Notes: Nearest neighbor matching. Estimated using teffects psmatch in Stata 15

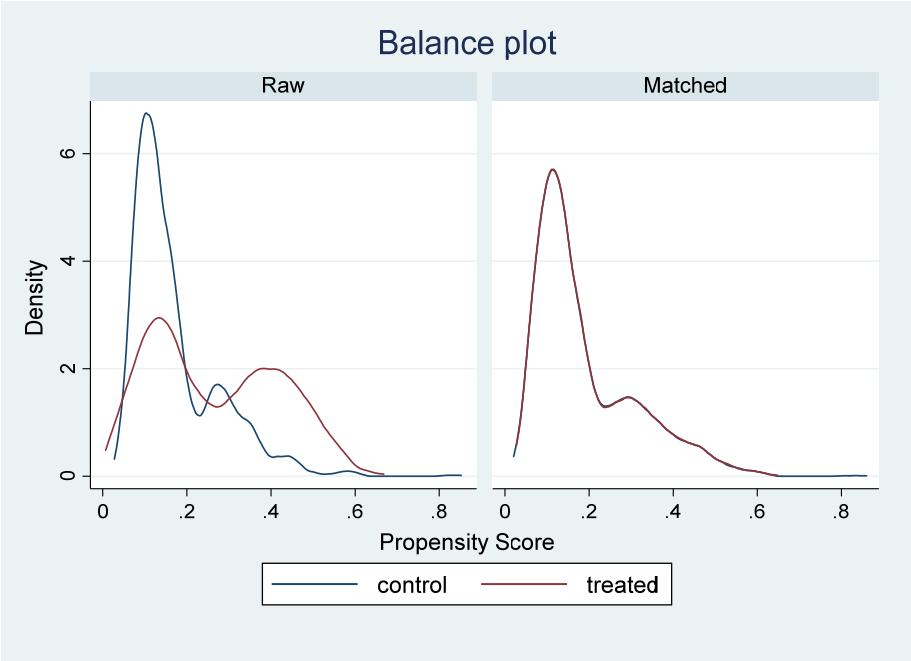


19-50 employees-Sales

	Raw	Matched
Total number of observations	1,053	2,106
Treatment observations	200	1,053
Control observations	853	1,053

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.29	-0.13	0.94	0.75
Average pre-intervention sales	0.19	0.05	1.41	1.01
Industry (construction is reference category)				
Manufacturing	-0.11	0.09	0.88	1.10
Retail Trade	-0.33	-0.07	0.56	0.90
Services	-0.27	-0.06	0.64	0.92
Other	-0.05	0.01	0.78	1.04
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.12	-0.07	1.20	0.89
San Joaquin Valley	0.07	0.05	1.23	1.16
Southern	-0.13	-0.05	1.04	1.02
Southern Border	-0.05	0.08	0.86	1.24

Notes: Nearest neighbor matching, 2 nearest neighbors. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $100 million) were removed from the sample. Estimated using teffects psmatch in Stata 15.

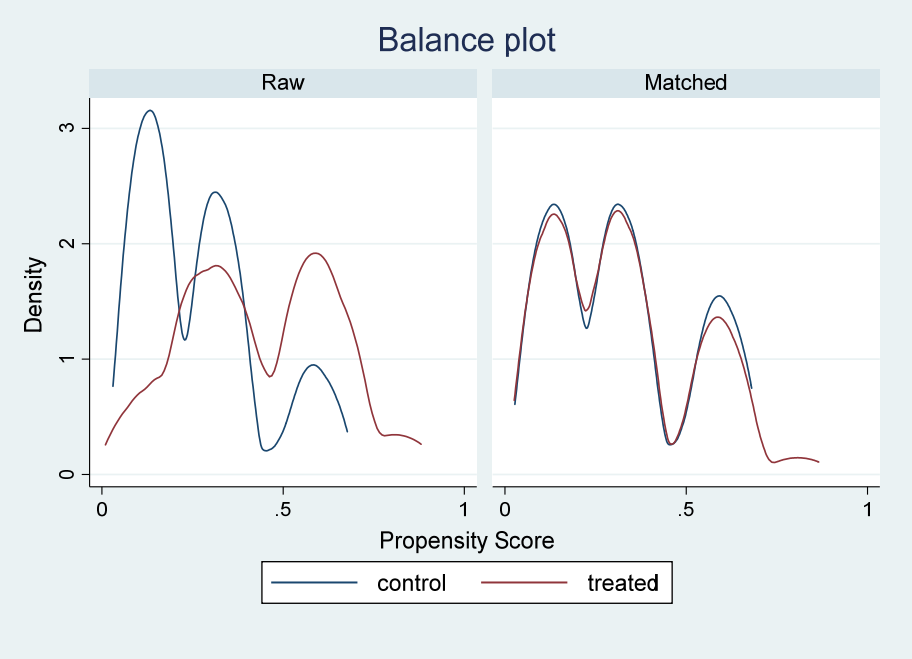


51-100 Employees-Total Employment

	Raw	Matched
Total number of observations	402	804
Treatment observations	130	402
Control observations	272	402

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.17	0.03	0.86	0.81
Average pre-intervention employment	0.05	-0.04	0.84	0.74
Industry (construction is reference category)				
Manufacturing	0.03	0.00	1.03	1.00
Retail Trade	-0.46	0.01	0.37	1.02
Services	-0.42	-0.06	0.43	0.90
Other	-0.11	0.07	0.63	1.33
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.02	-0.10	1.04	0.86
San Joaquin Valley	0.22	0.02	1.97	1.08
Southern	-0.10	0.13	1.05	0.93
Southern Border	-0.03	-0.14	0.89	0.54
Outside California	-0.07	0.06	0.53	1.49

Notes: Nearest neighbor matching. Estimated using teffects psmatch in Stata 15.

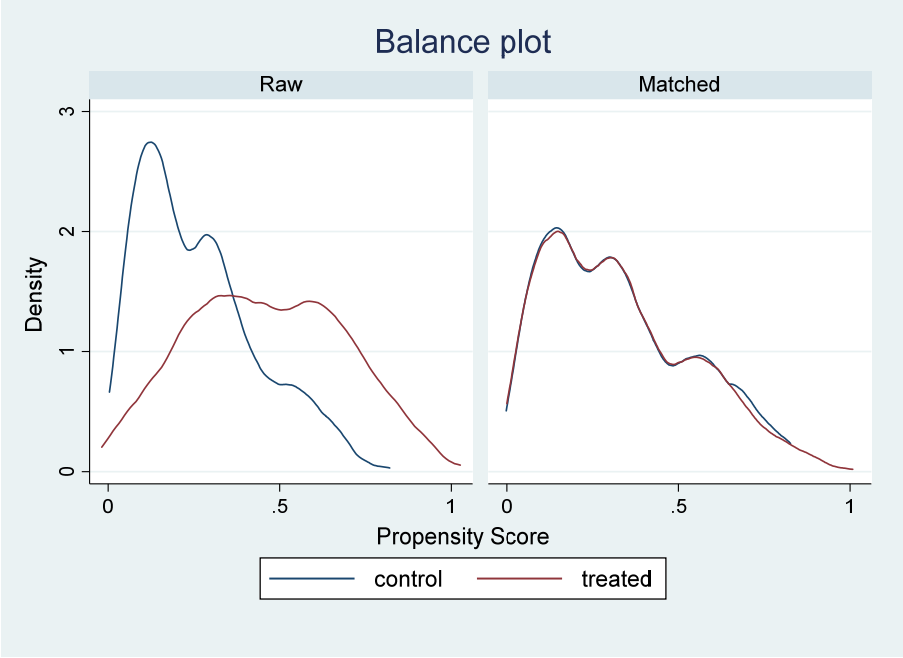


51-100 Employees-Sales

	Raw	Matched
Total number of observations	387	774
Treatment observations	127	387
Control observations	260	387

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.17	0.00	0.84	0.91
Average pre-intervention sales	0.42	-0.03	1.96	0.98
Industry (construction is reference category)				
Manufacturing	0.03	0.10	1.03	1.06
Retail Trade	-0.46	0.06	0.32	1.11
Services	-0.44	-0.08	0.43	0.88
Other	-0.10	-0.18	0.66	0.39
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.01	0.15	1.02	1.24
San Joaquin Valley	0.25	0.02	2.20	1.08
Southern	-0.12	-0.15	1.06	1.07
Southern Border	-0.03	0.08	0.92	1.28
Outside California	-0.07	-0.10	0.52	0.25

Notes: Nearest neighbor matching. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $55 million) were removed from the sample. Estimated using teffects psmatch in Stata 15.

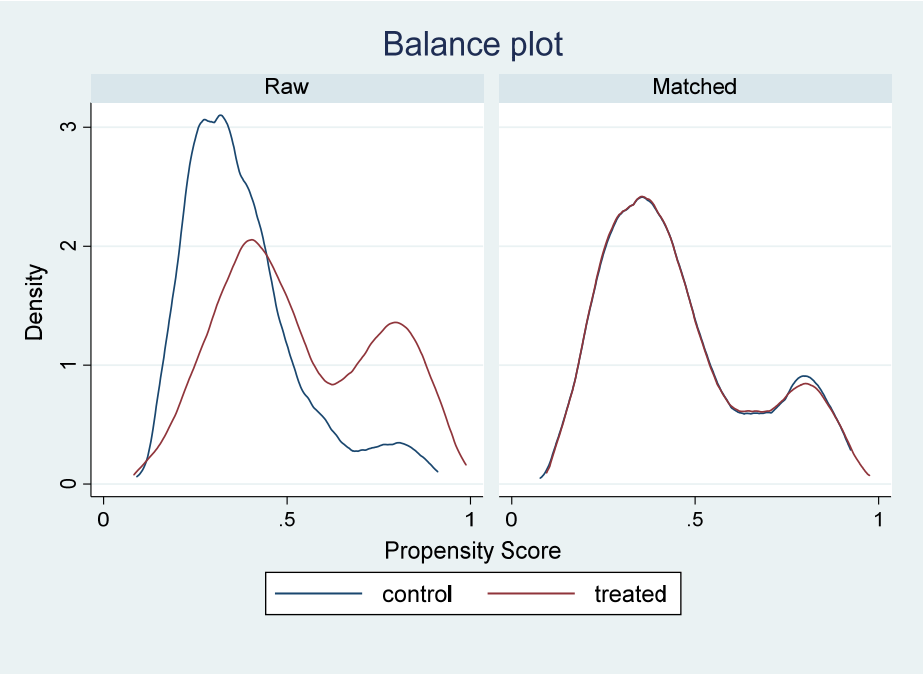


101+ Employees-Total Employment

	Raw	Matched
Total number of observations	509	1,018
Treatment observations	229	509
Control observations	280	509

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.48	-0.03	1.10	0.93
Average pre-intervention employment	0.15	-0.03	2.11	0.99
Industry (construction is reference category)				
Manufacturing	-0.11	-0.10	0.96	0.96
Retail Trade	-0.18	0.01	0.67	1.03
Services	-0.27	0.05	0.69	1.06
Other	0.02	0.01	1.07	1.03
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.08	0.02	0.88	1.03
San Joaquin Valley	0.10	0.04	1.45	1.14
Southern	0.05	-0.01	0.98	1.00
Southern Border	-0.13	0.01	0.68	1.03
Outside California	0.06	0.01	1.52	1.06

Notes: Nearest neighbor matching, 5 nearest neighbors. To improve covariate balance, outliers (companies with average pre-intervention employment larger than 10,000) were removed from the sample. Estimated using teffects psmatch in Stata 15.

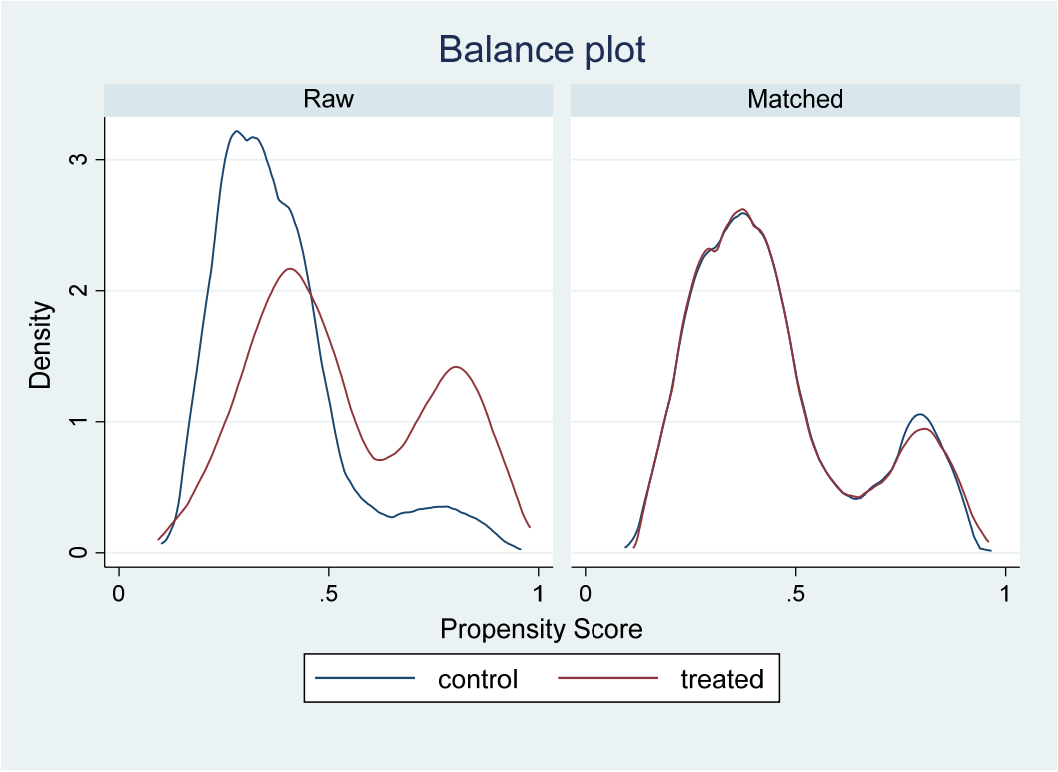


101+ Employees-Sales

	Raw	Matched
Total number of observations	505	1,010
Treatment observations	227	505
Control observations	278	505

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.47	-0.03	1.09	0.94
Average pre-intervention sales	0.17	0.02	2.28	0.96
Industry (construction is reference category)				
Manufacturing	-0.11	-0.09	0.96	0.96
Retail Trade	-0.20	0.02	0.65	1.04
Services	-0.27	0.06	0.69	1.07
Other	0.02	0.00	1.07	1.02
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.08	0.02	0.88	1.03
San Joaquin Valley	0.07	0.00	1.29	1.01
Southern	0.06	0.02	0.98	0.99
Southern Border	-0.11	-0.02	0.70	0.94
Outside California	0.06	0.00	1.52	1.02

Notes: Nearest neighbor matching, 10 nearest neighbors. Estimated using teffects psmatch in Stata 15.



Covariate Balance-Subgroups by Age

0-10 Years of Age-Total Employment

	Raw	Weighted
Total number of observations	569	569
Treatment observations	117	286
Control observations	452	283

	Standardized mean difference		Variance ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Age	0.13	-0.05	0.91	0.91
Average pre-intervention employment	0.14	0.01	2.57	1.06
Industry (construction is reference category)				
Manufacturing	-0.27	0.03	0.59	1.04
Retail Trade	-0.05	-0.01	0.93	0.99
Services	0.06	0.00	1.04	1.00
Other	-0.05	-0.03	0.82	0.86
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.05	-0.05	1.06	0.95
San Joaquin Valley	0.03	0.03	1.10	1.10
Southern	-0.10	0.01	1.01	1.00
Southern Border	-0.08	0.04	0.80	1.11
Outside California	-0.06	-0.02	0.56	0.82

Overidentification test: chi2(12)=9.037, Prob > chi2 = 0.700

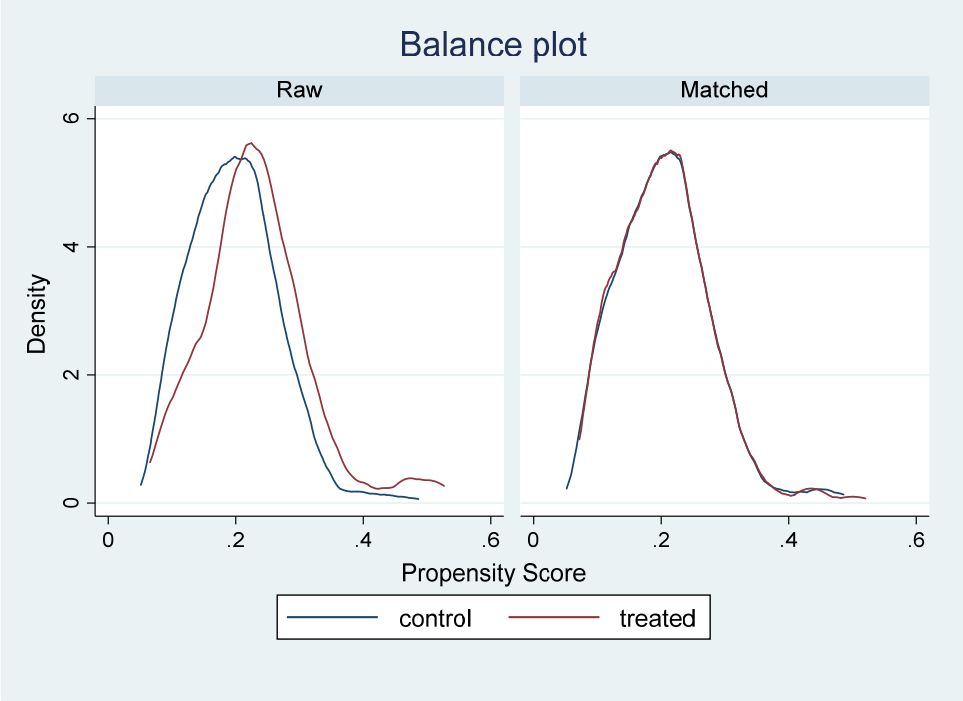
Notes: Inverse probability weighting. To improve covariate balance, outliers (companies with average pre-intervention employment larger than 1,000) were removed from the sample. Estimated using teffects ipw in Stata 15.

0-10 Years of Age-Sales

	Raw	Matched
Total number of observations	571	1,142
Treatment observations	117	571
Control observations	454	571

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.13	-0.04	0.92	0.90
Average pre-intervention sales	0.07	0.06	1.08	1.00
Industry (construction is reference category)				
Manufacturing	-0.27	-0.11	0.58	0.81
Retail Trade	-0.05	0.00	0.94	1.00
Services	0.07	0.02	1.05	1.01
Other	-0.06	0.16	0.79	1.77
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.06	-0.16	1.07	0.80
San Joaquin Valley	0.03	0.22	1.11	1.87
Southern	-0.10	-0.02	1.01	1.00
Southern Border	-0.09	0.06	0.78	1.19
Outside California	-0.06	-0.02	0.56	0.86

Notes: Nearest neighbor matching. Estimated using teffects psmatch in Stata 15.



11-30 Years of Age-Total Employment

	Raw	Weighted
Total number of observations	777	777
Treatment observations	131	388
Control observations	646	389

	Standardized mean difference		Variance ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Age	-0.01	-0.03	1.07	0.96
Average pre-intervention employment	0.28	0.05	3.28	1.00
Industry (construction is reference category)				
Manufacturing	-0.13	0.02	0.83	1.02
Retail Trade	-0.35	-0.01	0.49	0.98
Services	0.14	-0.01	1.11	0.99
Other	-0.03	-0.01	0.89	0.98
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.03	0.02	0.96	1.03
San Joaquin Valley	0.15	-0.01	1.68	0.97
Southern	-0.04	-0.04	1.02	1.02
Southern Border	-0.13	0.04	0.71	1.09
Outside California	0.09	-0.02	2.46	0.77

Overidentification test: chi2(12)= 6.765, Prob > chi2 = 0.873

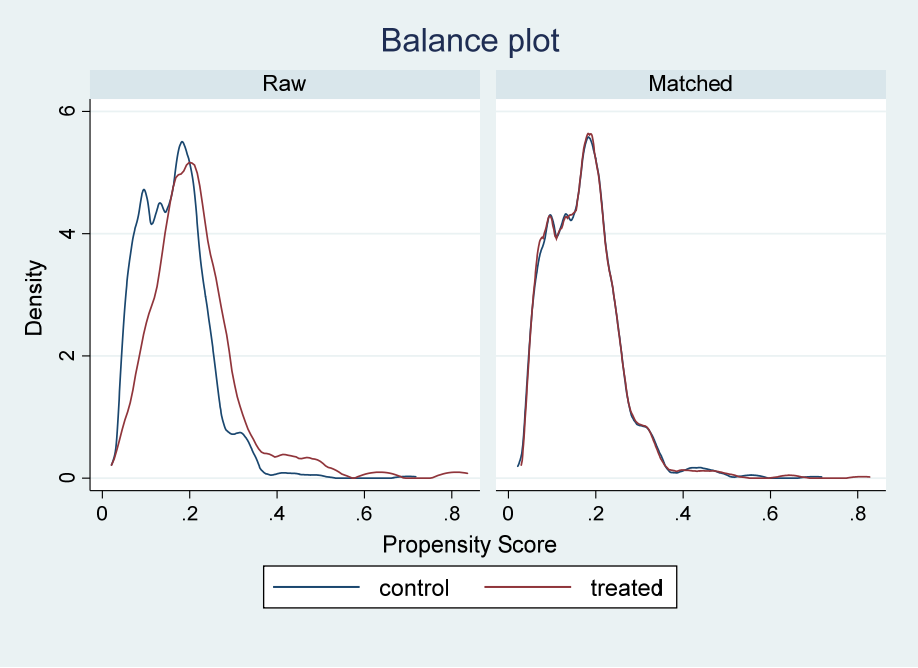
Notes: Inverse probability weighting. To improve covariate balance, outliers (companies with average pre-intervention employment larger than 1,000) were removed from the sample. Estimated using teffects ipw in Stata 15.

11-30 Years of Age-Sales

	Raw	Matched
Total number of observations	782	1,564
Treatment observations	134	782
Control observations	648	782

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.01	0.02	1.11	1.02
Average pre-intervention sales	0.27	0.01	2.90	0.88
Industry (construction is reference category)				
Manufacturing	-0.13	-0.03	0.84	0.97
Retail Trade	-0.36	0.01	0.48	1.01
Services	0.13	0.04	1.11	1.03
Other	0.01	-0.10	1.04	0.60
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.04	0.02	0.95	1.03
San Joaquin Valley	0.14	0.06	1.65	1.25
Southern	-0.03	0.00	1.02	1.00
Southern Border	-0.11	0.01	0.74	1.02
Outside California	0.09	-0.05	2.41	0.55

Notes: Nearest neighbor matching, 3 nearest neighbors. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $200 million) were removed from the sample Estimated using teffects psmatch in Stata 15.

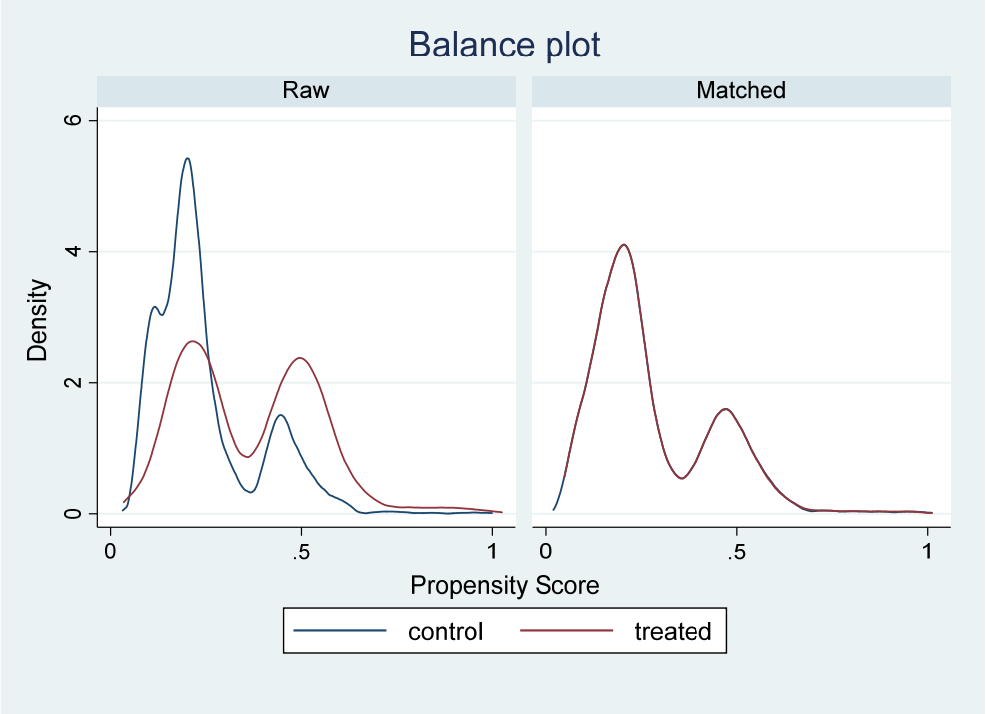


31+ Years of Age-Total Employment

	Raw	Matched
Total number of observations	1,554	3,108
Treatment observations	434	1,554
Control observations	1,120	1,554

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Average pre-intervention employment	0.28	0.03	3.64	0.93
Industry (construction is reference category)				
Manufacturing	-0.18	0.01	0.92	1.00
Retail Trade	-0.43	0.05	0.44	1.07
Services	-0.09	-0.06	0.78	0.86
Other	0.03	-0.04	1.16	0.83
	-0.18	0.01	0.92	1.00
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.10	0.01	1.19	1.03
San Joaquin Valley	0.04	-0.07	1.11	0.83
Southern	-0.10	0.04	1.05	0.97
Southern Border	-0.03	-0.05	0.88	0.79
Outside California	0.00	-0.06	1.03	0.29

Notes: Nearest neighbor matching. To improve covariate balance, outliers (companies with average pre-intervention employment larger than 10,000) were removed from the sample. Estimated using teffects psmatch in Stata 15.

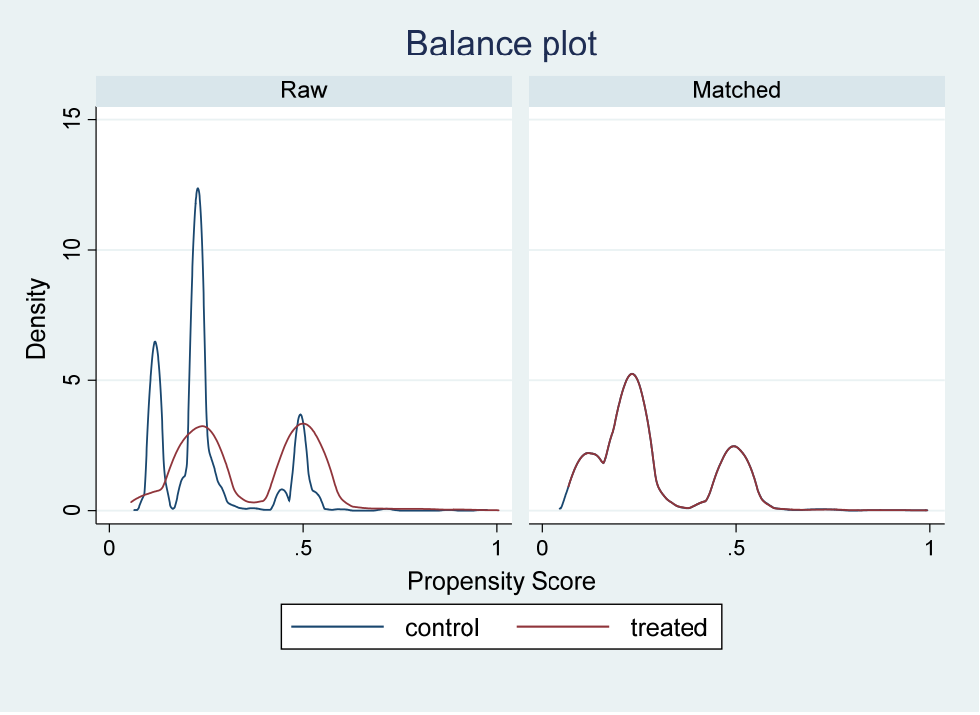


31+ Years of Age-Sales

	Raw	Matched
Total number of observations	1,608	3,216
Treatment observations	457	1,608
Control observations	1,151	1,608

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Average pre-intervention sales	0.22	0.02	2.91	0.80
Industry (construction is reference category)				
Manufacturing	-0.17	0.01	0.92	1.00
Retail Trade	-0.43	0.01	0.44	1.01
Services	-0.09	0.02	0.79	1.07
Other	0.01	-0.10	1.05	0.61
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.10	-0.18	1.18	0.70
San Joaquin Valley	0.04	-0.04	1.11	0.90
Southern	-0.10	0.16	1.05	0.91
Southern Border	0.00	0.04	1.02	1.16
Outside California	0.03	0.00	1.51	1.00

Notes: Nearest neighbor matching. To improve covariate balance, outliers (companies with average pre-intervention sales larger than $2 billion) were removed from the sample. Estimated using teffects psmatch in Stata 15.



Covariate Balance-Subgroups by Industry

Construction-Total Employment

	Raw	Weighted
Total number of observations	707	707
Treatment observations	275	346
Control observations	432	361

	Standardized mean difference		Variance ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Age	0.57	-0.06	1.18	0.69
Average pre-intervention employment	0.58	-0.07	4.04	1.06
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.28	-0.09	1.43	0.90
San Joaquin Valley	0.01	0.06	1.02	1.16
Southern	-0.18	0.01	0.99	1.00
Southern Border	-0.08	0.03	0.79	1.10
Outside California	-0.05	-0.01	0.53	0.83

Overidentification test: chi2(12)= 4.886, Prob > chi2 = 0.770

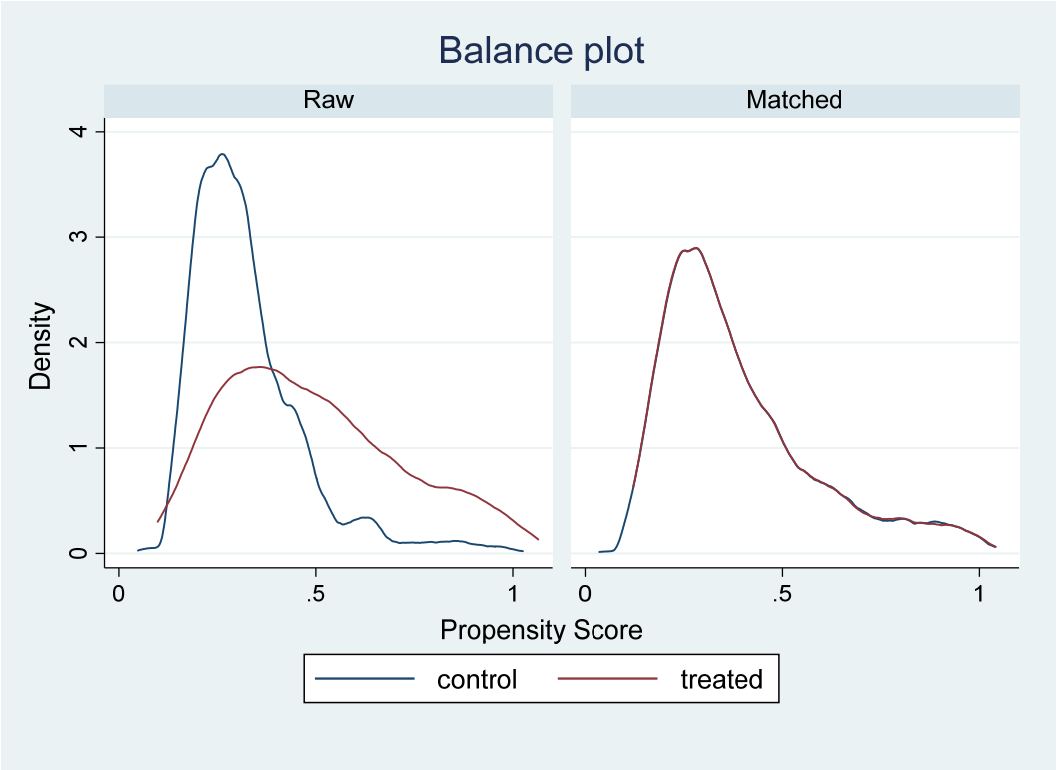
Notes: Inverse probability weighting. Estimated using teffects ipw in Stata 15.

Construction-Sales

	Raw	Matched
Total number of observations	708	1,416
Treatment observations	276	708
Control observations	432	708

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.57	-0.04	1.18	0.81
Average pre-intervention sales	0.60	0.04	4.73	0.93
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.27	-0.07	1.42	0.91
San Joaquin Valley	0.01	0.02	1.02	1.06
Southern	-0.18	0.01	0.99	1.00
Southern Border	-0.07	0.04	0.82	1.13
Outside California	-0.05	-0.07	0.52	0.43

Notes: caliper matching; caliper = 0.1. Estimated using teffects psmatch in Stata 15.



Manufacturing-Total Employment

	Raw	Weighted
Total number of observations	907	907
Treatment observations	191	452
Control observations	716	455

	Standardized mean difference		Variance ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Age	0.35	-0.03	1.18	0.89
Average pre-intervention employment	0.38	0.04	6.24	0.83
Employment growth ("increase" is reference category)				
Steady	-0.18	0.00	1.39	0.99
Decrease	0.18	0.00	1.54	0.99
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.25	0.03	0.56	1.05
San Joaquin Valley	0.01	-0.01	1.04	0.95
Southern	0.20	-0.02	0.82	1.01
Southern Border	-0.03	0.03	0.91	1.11
Outside California	-0.02	-0.07	0.75	0.23

Overidentification test: chi2(12)= 8.681 , Prob > chi2 = 0.563

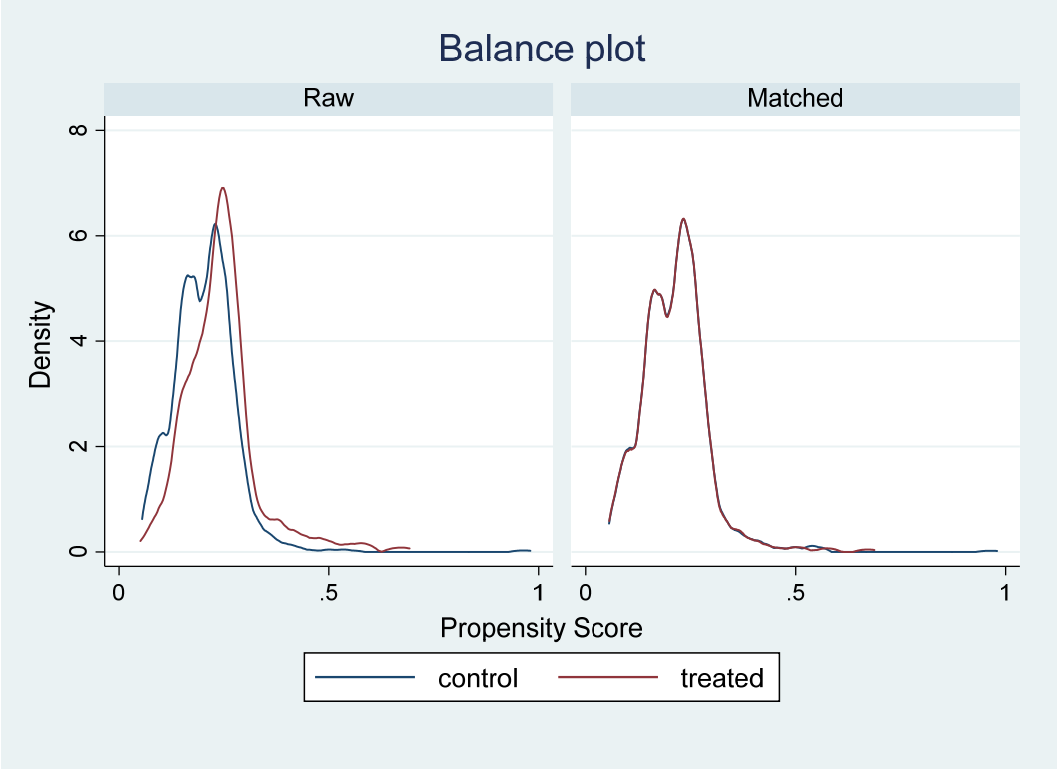
Notes: Inverse probability weighting. Estimated using teffects ipw in Stata 15.

Manufacturing-Sales

	Raw	Matched
Total number of observations	906	1,812
Treatment observations	192	906
Control observations	714	906

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	0.34	-0.07	1.17	0.93
Average pre-intervention sales	0.21	0.08	1.63	0.74
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.22	0.01	0.61	1.01
San Joaquin Valley	0.01	0.01	1.04	1.04
Southern	0.18	0.06	0.83	0.95
Southern Border	-0.03	-0.10	0.90	0.66

Notes: nearest neighbor matching. Estimated using teffects psmatch in Stata 15.

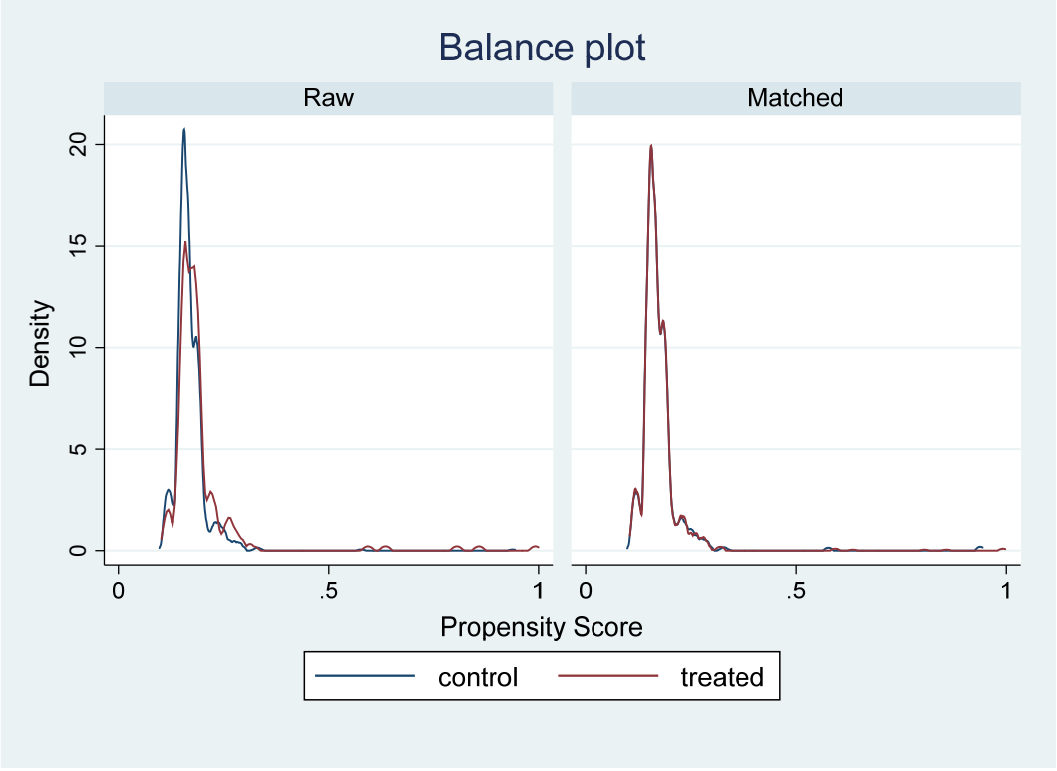


Retail and Services-Total Employment

	Raw	Matched
Total number of observations	1,210	2,420
Treatment observations	210	1,210
Control observations	1,000	1,210

	Standardized mean difference		Variance ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Age	0.00	0.03	1.11	0.91
Average pre-intervention employment	0.24	0.04	10.74	1.05
Employment growth ("increase" is reference category)				
Steady	-0.01	-0.03	1.02	1.06
Decrease	-0.03	0.03	0.93	1.05
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	-0.02	-0.12	0.97	0.81
San Joaquin Valley	0.11	0.00	1.36	1.01
Southern	-0.04	0.10	1.02	0.95
Southern Border	-0.09	-0.01	0.75	0.96
Outside California	0.04	0.02	1.59	1.28

Notes: nearest neighbor matching. Estimated using teffects psmatch in Stata 15.

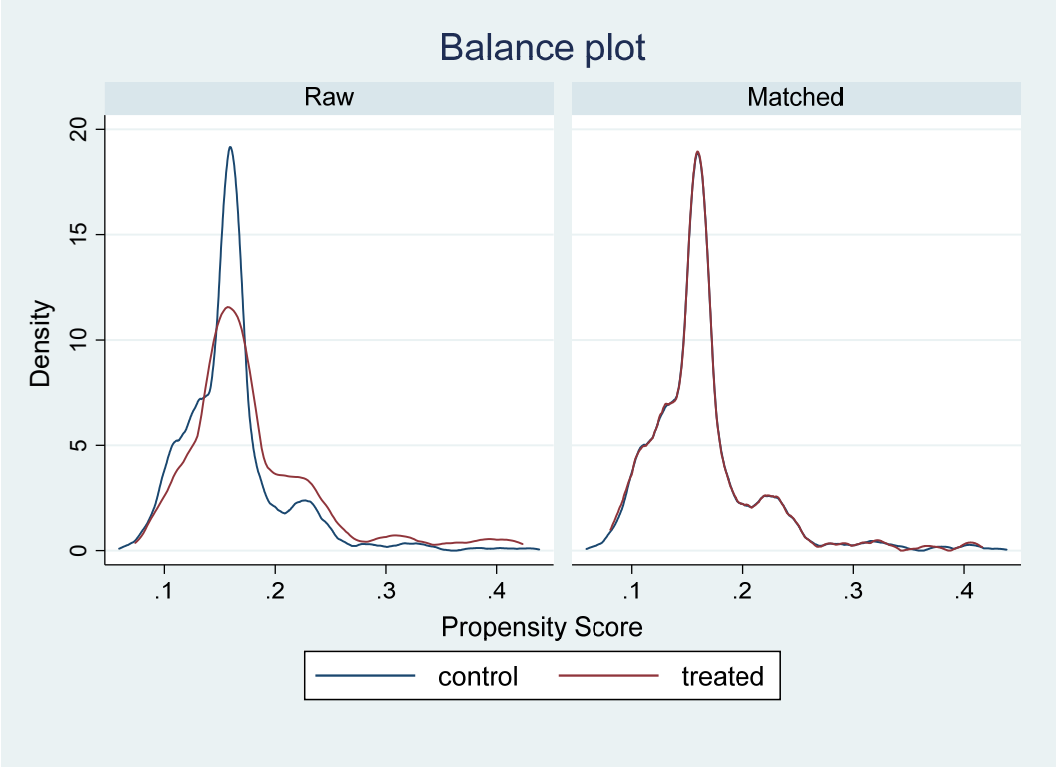


Retail and Services-Sales

	Raw	Matched
Total number of observations	1,184	2,368
Treatment observations	194	1,184
Control observations	990	1,184

	Standardized mean difference		Variance ratio	
	Raw	**Matched**	**Raw**	**Matched**
Age	-0.08	-0.05	1.04	1.02
Average pre-intervention sales	0.22	-0.02	2.05	0.96
Economic Market (Sacramento is reference category)				
San Francisco Bay Area	0.00	0.06	1.00	1.09
San Joaquin Valley	0.11	-0.04	1.37	0.89
Southern	-0.05	0.02	1.02	0.99
Southern Border	-0.11	-0.03	0.70	0.90

Notes: nearest neighbor matching. Estimated using teffects psmatch in Stata 15.



References

California Community Colleges. (2018). *Doing What Matters: Employment Training Panel Contract Education*. Retrieved April 20, 2018, from http://doingwhatmatters.cccco.edu/ForWEDDGrantees/ContractEducation/EmploymentTrainingPanel.aspx.

Farrell, Diana, and Fiona Greig. (2016, February). *Paychecks, Paydays, and the Online Platform Economy: Big Data on Income Volatility*. New York: JP Morgan Chase & Co. Institute. Retrieved from https://www.jpmorganchase.com/corporate/institute/document/jpmc-institute-volatility-2-report.pdf.

Frazis, Harley, J., Diane E. Herz, and Michael W. Corrigan. (1995, May). Employer-Provided Training: Results from a New Survey. *Monthly Labor Union, 118*(5), 3-17.

González, Raquel, Marian Negoita, Lea Folsom, and Renatta DeFever (2020). *Survey Issue Brief: California Employer Training Needs.* Oakland, CA: Social Policy Research Associates.

Holbrook, Allyson, Jon A. Krosnick, and Alison Pfent. (2007). The causes and consequences of response rates in surveys by the news media and government contractor survey research firms. *Advances in telephone survey methodology*, New Jersey: John Wiley & Sons, 499-528.

Hollenbeck, Kevin. (2008). *Is There a Role for Public Support of Incumbent Worker On-the-Job Training?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Retrieved from https://doi.org/10.17848/pol2015-001.

Kalleberg, Arne L. (2013). *Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States, 1970s to 2000s*. New York: Russell Sage Foundation. Retrieved from https://www.russellsage.org/publications/good-jobs-bad-jobs-1.

Kohut, Andrew, Scott Keeter, Carroll Doherty, Michael Dimock, and Lea Christian. *Assessing the representativeness of public opinion surveys*. Washington, DC: Pew Center. Retrieved from: http://assets.pewresearch.org/wp-content/uploads/sites/5/legacy-pdf/Assessing%20the%20Representativeness%20of%20Public%20Opinion%20Surveys.pdf.

Lerman, Robert I. (2013, November). *Should Employer-Led Training Be the Framework for Workforce Development?* College Park, MD: Center for International Policy Exchanges, University of Maryland. Retrieved from http://umdcipe.org/conferences/WorkforceDevelopment/Papers/Workforce_Development_Lerman_Should_Employer-Led_Training_be_the_Framework_for_Workforce_Development.pdf.

Los Angeles Economic Development Corporation. (2018, February). *Economic Forecast and Industry Outlook: California and Los Angeles County, 2018–2019*. Los Angeles: Institute for Applied Economics. Retrieved from https://laedc.org/wp-content/uploads/2018/02/LAEDC-2018-19-Economic-Forecast.pdf.

Manyika, James, Michael Chui, Medhi Miremadi, Jacques Bughin, Katy George, Paul Willmott, and Martin Dewhurst. (2017, January). *A Future that Works: Automation, Employment, and Productivity*. San Francisco, CA: McKinsey & Company. Retrieved from https://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works.

Moore, Richard. W., Daniel Blake, G. Michael Phillips, and Daniel McConaughy (2003). "Training That Works: Lessons from California's Employment Training Panel Program." Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Morrison, Tom, Bob Maciejewski, Craig Giffi, Emily Stover DeRocco, Jennifer McNelly, and Carrick Gardner. (2011). *Boiling Point? The Skills Gap in US Manufacturing*. Washington, DC: The Manufacturing Institute. Retrieved from http://www.themanufacturinginstitute.org/~/media/A07730B2A798437D98501E798C2E13AA.ashx.

Orenberg, Jacob. (2017). *2018-2019 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program*. California Energy Commission, Fuels and Transportation Division. Publication Number: CEC-600-2017-010-SD. Retrieved from http://docketpublic.energy.ca.gov/PublicDocuments/17-ALT-01/TN221664_20171102T105305_20182019_Investment_Plan_Update_for_the_Alternative_and_Renewab.pdf.

Osterman, Paul. (2008). Improving Job Quality: Policies Aimed at the Demand Side of the Low-Wage Labor Market. In Timothy J. Bartik and Susan N. Houseman (Eds.), *A Future of Good Jobs? America's Challenge in the Global Economy* (pp. 203–244). Kalamazoo, MI: W.E. Upjohn Institute. https://doi.org/10.17848/9781435641037.ch6.

Papke, Leslie E., and Jeffrey M. Wooldridge. (1996). Econometric Methods for Fractional Response Variables with an Application to 401(K) Plan Participation Rates. *Journal of Applied Econometrics*, *11*, 619–632.

Peterson, Alexandra Conway. (2018, April 2). Choosing a Training Provider Should be as Easy as Buying a Car. Retrieved from https://www.linkedin.com/pulse/choosing-training-provider-should-easy-buying-car-conway-peterson.

Rolstad, Sindre, John Adler, and Anna Rydén. Response burden and questionnaire length: is shorter better? A review and meta-analysis. *Value in Health*, *14(8)*, 1101-1108.

State of California, Employment Development Department. (2017). *Size of Business Data for California, 2015 Q1*. Retrieved April 30, 2018, from http://www.labormarketinfo.edd.ca.gov/LMID/Size_of_Business_Data_for_CA.html.

U.S. Department of Labor, U.S. Department of Commerce, U.S. Department of Education, and U.S. Department of Health and Human Services. (2014, July 22). *What Works in Job Training: A Synthesis of the Evidence*. Washington, DC: Authors. Retrieved from https://www.dol.gov/asp/evaluation/jdt/jdt.pdf.

Vannieuwenhuyze, Jorre, Geert Loosveldt, and Geert Molenberghs. "A Method for Evaluating Mode Effects in Mixed-Mode Surveys." *Public Opinion Quarterly* 74, no. 5 (January 1, 2010): 1027–45. https://doi.org/10.1093/poq/nfq059.

World Economic Forum. (2017, July). *Accelerating Workforce Reskilling for the Fourth Industrial Revolution: An Agenda for Leaders to Shape the Future of Education, Gender and Work*. Geneva, Switzerland: Author. Retrieved from http://www3.weforum.org/docs/WEF_EGW_White_Paper_Reskilling.pdf.

Zeidenberg, Matthew, Sung-Woo Cho, and Davis Jenkins. (2010, September). *Washington State's Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness*

(CCRC Working Paper No. 20). New York: Community College Research Center. Retrieved from https://eric.ed.gov/?id=ED512261.